ROBO-8112VG2AR
ROBO-8112VG2AR-Q87

Single Host Board

User's Manual

Version 1.1

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Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your ROBO-8112VG2AR series system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get ROBO-8112VG2AR series running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

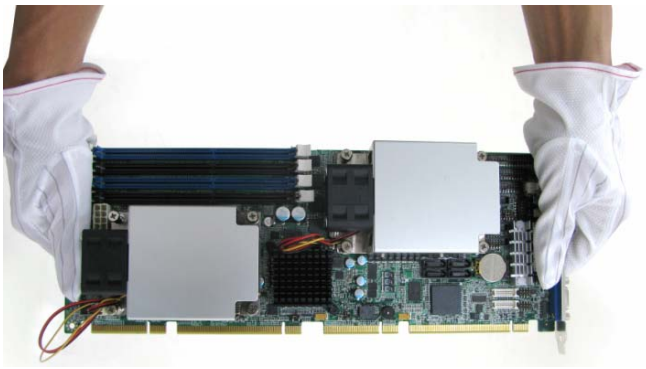
Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.portwell.com.tw/.

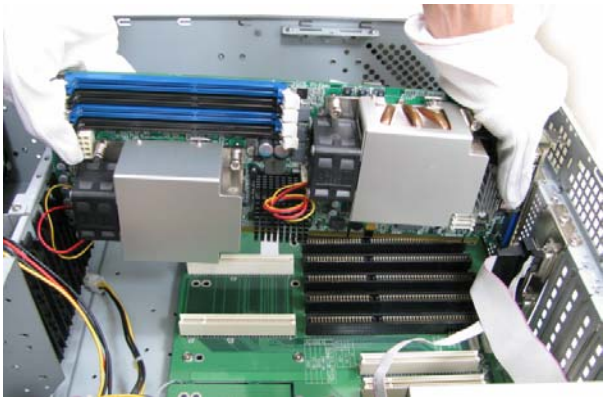
Notice
SBC Handling and Installation Notice

- Handling and Installing SBC

Caution: Do not just hold any single side of the SBC; hold evenly on both sides!

- Heavy processor cooler may bend the SBC when SBC being held just on one side.
- The bending may cause soldering or components damaged.





■ Fix your SBC in System

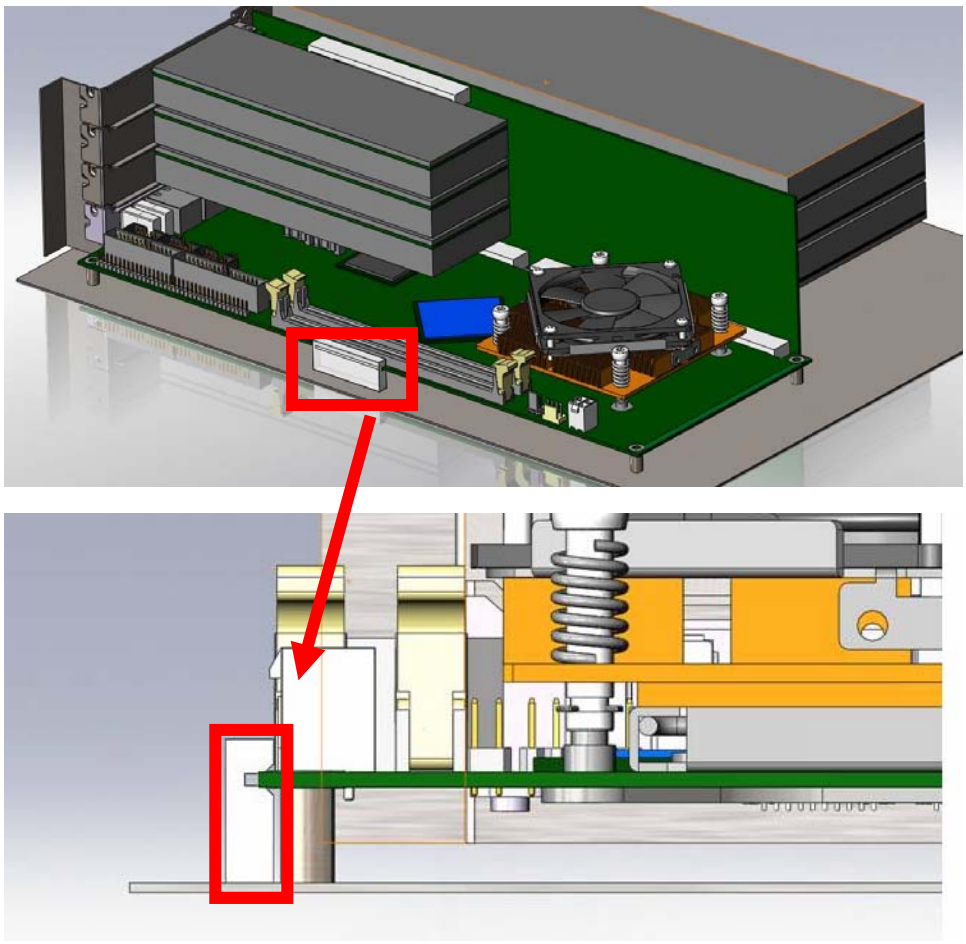
Caution: Suggest your S.I or vendor to use a metal bracket to hold/fix the desktop or server grade SBC to avoid the vibration damage during transportation. Heavy processor cooler may bend the SBC when systems are during transportation without any holder.

Example:

- 4U chassis :

  ➔ Use L type mental or plastic or rubber bracket to hold SBC.

- 2U or 1U chassis: a mental bracket on the bottom of chassis to balance and support SBC from bending.



Chapter 1
System Overview

1.1 Introduction

ROBO-8112VG2AR series, the PICMG 1.3 SHB (Single Host Board) supports the Intel® 4th Generation Core i3/i5/i7 and Xeon E3-1200v3 series processors. The attractive Core i3/i5/i7 and Xeon E3-1200v3 family processors not only posses amazing parallel computing power but also support ECC /non-ECC memory . That makes the system more powerful.

The SHB adopted Intel® C226 / Q87 chipset and Core i7/i5/i3/Xeon E3-1200v3 family processors. The 4th Generation Core i series /Xeon E3-1200v3 family processors integrated Intel® integrated graphics engine that supports 3D performance, DirectX11.1, Shader model 4.0, OpenCL 1.2 and OpenGL 3.2. More than that, user could utilize even higher-end, the latest PCI Express x16 interface graphics card via backplane.

ROBO-8112VG2AR series built with dual Intel® Gigabit Ethernet. Two DDR3 long DIMM sockets support system memory up to 16GB. Five SATA 600 ports (dual ports via backplane) support RAID 0, 1, 5, 10. Support triple display by DVI-I (DVI-D + VGA) on bracket and HDMI port on-board. The SBC also equipped with Six USB 3.0 ports (dual ports on bracket). It can offer 5Gbps data transfer rate which is higher than the current USB 2.0.

To meet bandwidth of storage and expansion cards requirement, the ROBO-8112VG2AR series were designed flexible with four PCI Express lanes via backplane. Those four PCI Express lanes could be four PCI Express x1 links or one PCI Express x4 link by different bios support. Four PCI Express x1 links configuration can support more PCI Express x1 devices via backplane and one PCI Express x4 link configuration can support RAID card or special add-on cards such as image processing board. In addition, the flexible configuration can be leveraged with bridge on backplane to support more PCI or PCI-X slots that benefits industries with legacy support. PCI Express x16 from processors can be one PCI Express x16 or two PCI Express x8 or One PCI Express x8 + Two PCI Express x4 by jumper setting with C226 chipset. It only supports one PCI Express x16 with Q87 chipset. Intel C226 chipset be very flexible for customer to adopt with server or non-server BP.

Advanced Management Technology (AMT) 9.0 is feature that ROBO-8112VG2AR series equipped with Xeon E3-1200v3 family and Core i5/i7 processors (Core i3 doesn't support AMT). This technology provides remote access capability via Intel® Gigabit Ethernet controller. The new technology is a hardware-based solution that uses out-of-band communication for system management access to client systems. Beside that, the hardware and software information can be gathering by 3rd party

software then storage in SPI interface EEPROM. Therefore, asset management could be done at the same time.

ROBO-8112VG2AR series features:

- Support Intel® Xeon E3-1200v3 family/Core i3 processors on ROBO-8112VG2AR and 4th Generation Core i7/i5 processors on ROBO-8112VG2AR-Q87 in an LGA1150 socket
- Two 240-pin DDR3 ECC SDRAM DIMM socket, support for DDR3 1333/1066 DIMMs, up to 16GB system memory
- Intel® Xeon E3-1200v3 family and 4th Generation Core i7/i5/i3 processor integrated graphic engine that supports MPEG-2 Decode, DirectX 11.1, OpenGL 3.2 and Shader Model 4.0
- Equipped dual Intel Gigabit Ethernet ports
- Support iAMT 9.0 on some sku
- Support five SATA 600 (dual ports via backplane)
- Support six USB 3.0 ports (dual ports on bracket)
- One PCI Express x16 external expansion, one PCI Express x4 link (can be configured as four PCI Express x1 by bios) and four PCI devices via backplane

The PICMG 1.3 SHB is the best solution of applications such like flight simulation, image processing, Medical, factory automation and so on that need performance of display and storage.

1.2 Check List

The ROBO-8112VG2AR package should cover the following basic items:

- ✓ One ROBO-8112VG2AR single host board
- ✓ One dual Serial ports cable kit
- ✓ One single Parallel port cable kit
- ✓ One FDD cable
- ✓ Two SATA 600 signal cable
- ✓ One Installation Resources CD-Title

Optional: One bracket with PS/2 keyboard and mouse

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main processor**

- Intel® Xeon E3-1200v3 family and 4th Generation Core i3 Processor on ROBO-8112VG2AR
- Intel® 4th Generation Core i7/i5 Processor on ROBO-8112VG2AR-Q87

- **BIOS**

- Phoenix system BIOS with SPI Serial CMOS EEPROM with easy upgrade function ACPI, DMI, Green function and Plug and Play Compatible

- **Main Memory**

- Support dual-channel DDR3 memory interface
- ECC, non-buffered DIMMs only on ROBO-8112VG2AR
- non-ECC, non-buffered DIMMs only on ROBO-8112VG2AR-Q87
- Two DIMM sockets support 1333/1600 DDR3-SDRAM up to 16GB System Memory

- **L2 Cache Memory**

- Built-in Processor

- **Chipset**

- Intel® C226 /Q87 chipset

- **Bus Interface**

- Follow PICMG 1.3 Rev 1.0 standard (PCI Express and PCI)
- Support one PCI Express x4 (can be as four PCI Express x1 through backplane by different bios), default is one PCI Express x4
- Support four PCI devices through backplane via ITE 8892E PCIEx1 to PCI bridge
- Support one PCI Express x16 or two PCI Express x8 or One PCI Express x8 + Two PCI Express x4 by jumper setting on ROBO-8112VG2AR
- Only support one PCI Express x16 on ROBO-8112VG2AR-Q87

- **SATA**

- Five SATA 300 ports on-board (dual ports via backplane)

- **Floppy Drive Interface**

- Support one FDD port up to two floppy drives and 5-1/4"(360K, 1.2MB), 3-1/2" (720K, 1.2MB, 1.44MB, 2.88MB) diskette format and 3-mode FDD

- **Serial Ports**

- One RS232 port
- One RS232/422/485 selectable by bios

- **Parallel Port**

- Support one parallel port with SPP, EPP and ECP modes

- **USB Interface**
- Support eight USB 2.0 (Universal Serial Bus) ports (four USB ports on-board and four USB ports via backplane)
- Support six USB 3.0 ports (dual ports on bracket that dedicated to keyboard & mouse; two ports on board for high-speed I/O peripheral devices)

- **PS/2 Mouse and Keyboard Interface**
- Support one 10-pin header for external PS/2 keyboard/mouse connection

- **Auxiliary I/O Interfaces**
- System reset switch, external speaker, Keyboard lock and HDD active LED, etc

- **Real Time Clock/Calendar (RTC)**
- Support Y2K Real Time Clock/Calendar with battery backup for 7-year data retention

- **Watchdog Timer**
- Support WDT function through software programming for enable/disable and interval setting
- Generate system reset

- **On-board VGA**
- Processors integrated graphics, share system memory up to 1GB for system with greater than or equal to 192MB of system memory

- **On-board Ethernet LAN**
- Dual Intel® PCI Express x1 interface based Gigabit Ethernet to support RJ-45 connector
- Built with Intel WGI217LM and WGI210AT Ethernet controller

- **High Driving GPIO**
- Support 8 programmable high driving GPIO

- **Cooling Fans**
- Support one 4-pin power connector for CPU fan and one 3-pin power connector for system fan

- **System Monitoring Feature**
- Monitor CPU temperature, system temperature and major power sources, etc.

- **Bracket**
- Support dual Ethernet port with 2 indicators, dual USB ports and one DVI-I port

- **Outline Dimension (L X W)**
- 338.5mm (13.33") X 126.39mm (4.98")

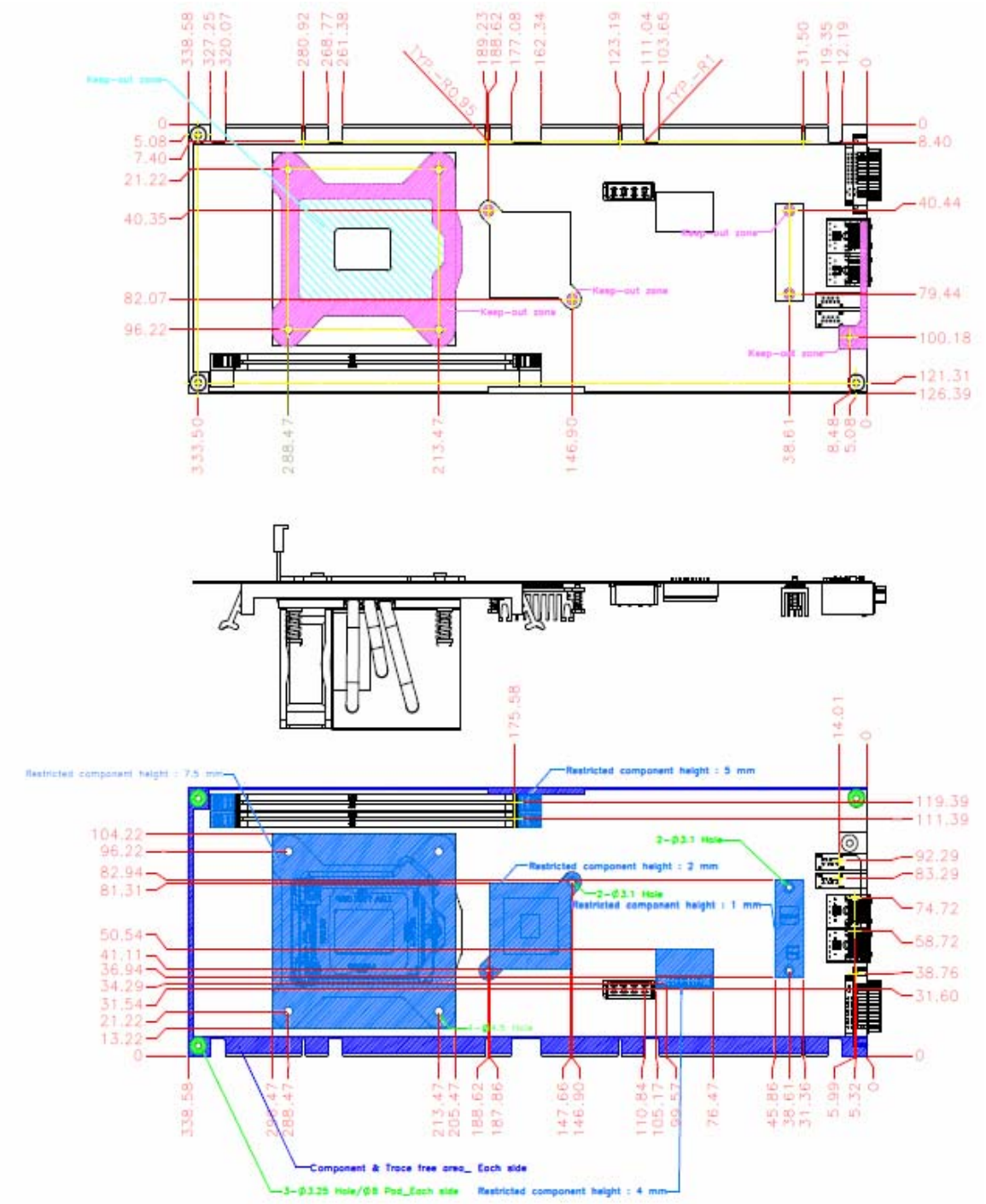
- **Power Requirements**
- +12V (CPU)@ 3.56A
- +12V (System+Device)@ 5.29A
- +5V (System+ Device)@ 4.94A
- Test Programs: BurnIn Test V6.0
- Run Time: Full loading 30 Min.

1.4 System Configuration

System Configuration	
CPU Type	Intel® Xeon® CPU E3-1275 V3 (ES) 3.50GHz L3:8M
SBC BIOS	Portwell, Inc. ROBO-8112VG2AR Rev.:R1.00.W0 (04182003)
Memory	WARIS DDR3 ECC UB-DIMM 1600 8GB*2 (hynix H5TQ4G83MFR)
VGA Card	Onboard Intel(R) HD Graphics P4600/P4700
VGA Driver	Intel(R) HD Graphics P4600/P4700 Version 9.18.10.3071
LAN Card	Onboard Intel(R) I210 Gigabit Network Connection
LAN Driver	Intel(R) I210 Gigabit Network Connection Version 12.4.36.0
LAN Card	Onboard Intel(R) Ethernet Connection I217-LM
LAN Driver	Intel(R) Ethernet Connection I217-LM Version 12.5.19.0
Audio Card	Onboard Realtek ALC886 High Definition Audio
Audio Driver	Realtek High Definition Audio Version 6.0.1.6873
Chip Driver	Intel(R) C226 Series Server Advanced SKU LPC Controller Version 9.4.0.1017
USB 3.0 Driver	Intel® USB 3.0 eXtensible Host Controller Version 2.0.0.100
SCSI Card	Adaptec 29160LP
SCSI HDD	Seagate ST39173W
SATA HDD	WD WD1002FAEX 1TB
Compact Flash	N/A
FDD	MITSUMI D353M3 1.44MB
SATA CDROM	ASUS DRW-24B3ST DVD-ROM
Power Supply	FSP350-60GLC
Back plane	PBPE-11A3 (ZR0)

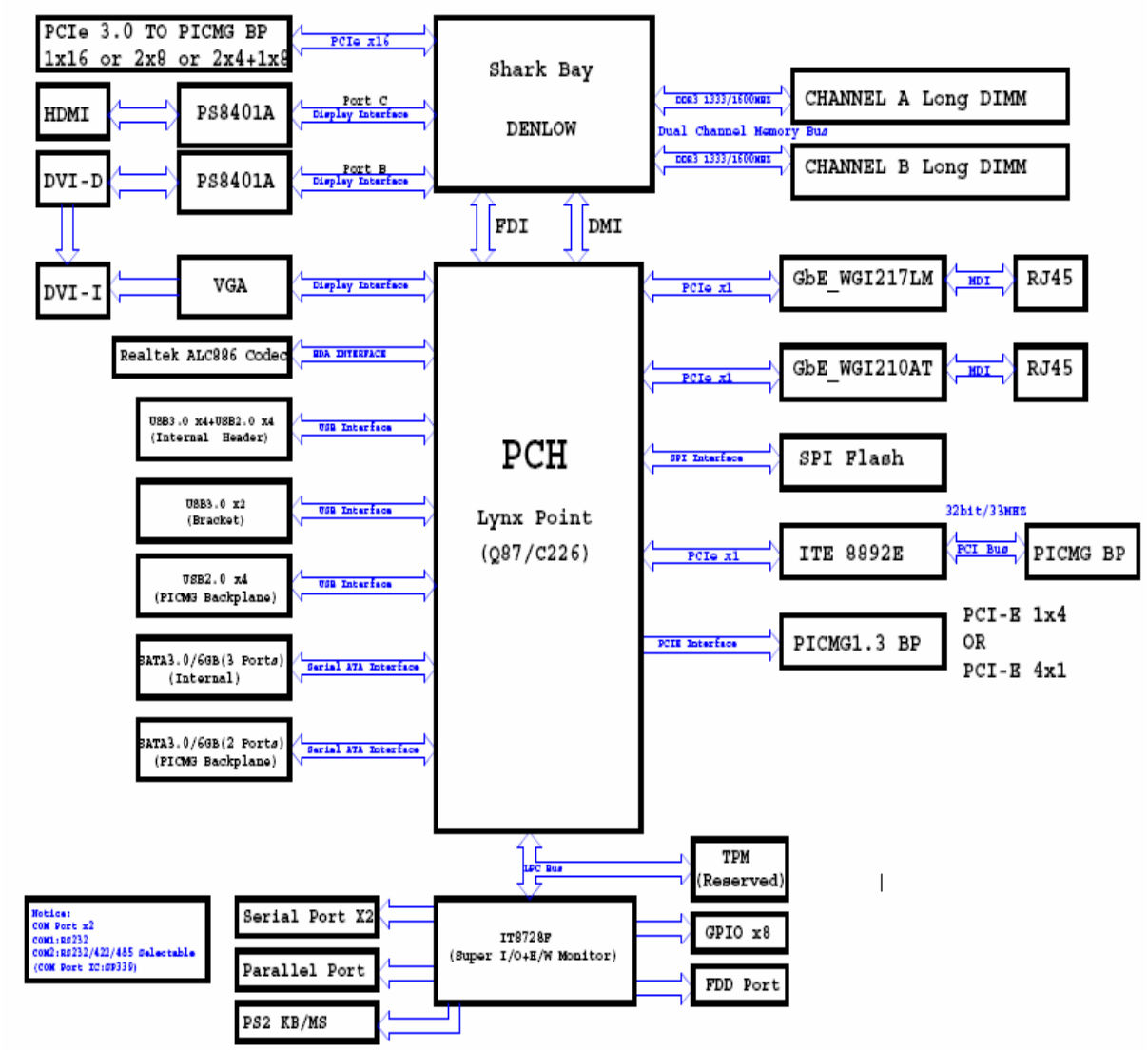
- Operating Temperature:
  - 0°C ~ 55°C (23°F ~ 140°F)
- Storage Temperature
  - -20°C ~ 80°C
- Relative Humidity
  - 5% ~ 90%, non-condensing

- Mechanical Drawing


Keep-out zone
Restricted component height : 7.5 mm
Restricted component height : 5 mm
Restricted component height : 2 mm
Restricted component height : 1 mm
Restricted component height : 4 mm
2-Ø3.1 Hole
Component & Trace free area_ Each side
3-Ø3.25 Hole/Ø8 Pad_Each side

1.5 System Architecture

All of details operating relations are shown in ROBO-8112VG2AR series System Block Diagram.



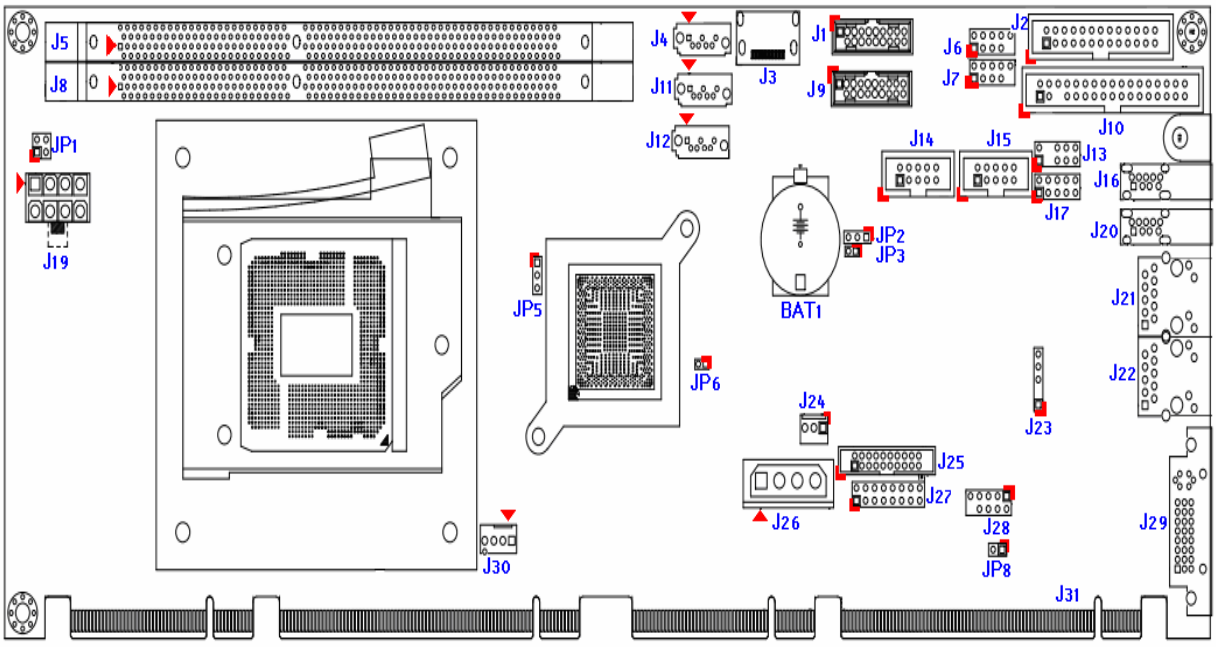
ROBO-8112VG2AR series System Block Diagram

Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on ROBO-8112VG2AR series are in the proper position. The default settings shipped from factory are marked with an asterisk (★).

2.1 Jumper Setting

In general, jumpers on the single board computer are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for "Not Connect".



Jump Setting List

★is mean default

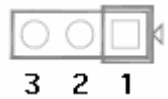
JP1: PCI Express Bifurcation Selection

PIN NO.	Function
Short (1-2 , 3-4)	1 x8, 2 x4 PCI Express (Support Three slot)
Short (1-2),Open(3-4)	2 x8 PCI Express (Support Two slot)
Open (1-2 , 3-4)	1 x16 PCI Express (Support One slot) ★

Note:

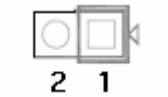
ROBO-8112VG2AR can support one PCIEx16 or two PCIEx8 or one PCIEx8 + two PCIEx4.

JP2: CMOS Clear



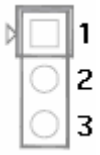
PIN NO.	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents

JP3: TEST_SETUP_MENU



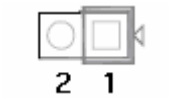
PIN NO	Function
1-2 Short	TEST SETUP MENU ENABLE
1-2 Open	DISABLE ★

JP5: CONFIG / RECOVERY



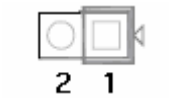
PIN NO.	Function
1-2-3 Open	RECOVERY
1-2 Short	Normal Operation ★
2-3 Short	CONFIGURE

JP6: SPI OVERRIDE PROTECTION



PIN NO.	Function
1-2 Short	DISABLE ME
1-2 Open	ENABLE ★

JP8:ATX Simulate AT Mode Select



PIN NO.	Function
1-2 Short	ATX simulate AT Mode
1-2 Open	ATX Mode ★

2.2 Connector Allocation

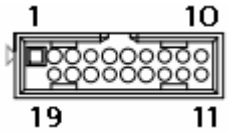
I/O peripheral devices are connected to the interface connectors.

Connector Function List

Connector	Function	Remark
J1/J9	Internal USB3 Connector	
J2	Parallel Port Connector	
J3	HDMI Connector	
J4/J11/J12	SATA 3 Connector	
J5/J8	DDR3 Long SLOT	
J6/J7	Internal USB2 Connector	
J10	Floppy Connector	
J13	External PS/2 Keyboard/Mouse Connector	
J14	COM2 Serial Port 2 Connector	
J15	COM1 Serial Port 1 Connector	
J16/J20	External USB3 Connector	
J17	General Purpose I/O Connector	
J19	+12V Power Connector	Connect to CPU
J21	Ethernet RJ-45 Connector (LAN 2)WGI210AT	
J22	Ethernet RJ-45 Connector (LAN 1)WGI217LM	
J23	SMBus Connector	
J24	SYSTEM FAN Power Connector	
J26	POWER 4P	For USB Power

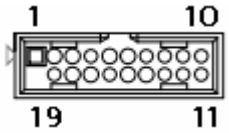
J27	Front Panel Pin HDR	
J28	Audio Connector	
J29	DVI Connector	
J30	CPU FAN Power Connector	
J31	PICMG 1.3 SLOT	

J1: Internal USB3 Connector



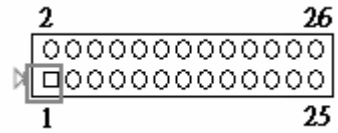
PIN No.	Signal Description	PIN No.	Signal Description
1	5V Dual	2	USB3_RX4_DN
3	USB3_RX4_DP	4	Ground
5	USB3_TX4_DN	6	USB3_TX4_DP
7	Ground	8	USB2_DN3
9	USB2_DP3	10	Ground
11	USB2_DP2	12	USB2_DN2
13	Ground	14	USB3_TX3_DP
15	USB3_TX3_DN	16	Ground
17	USB3_RX3_DP	18	USB3_RX3_DN
19	5V Dual	20	N/C

J9: Internal USB3 Connector



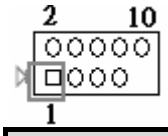
PIN No.	Signal Description	PIN No.	Signal Description
1	5V Dual	2	USB3_RX6_DN
3	USB3_RX6_DP	4	Ground
5	USB3_TX6_DN	6	USB3_TX6_DP
7	Ground	8	USB2_DN5
9	USB2_DP5	10	Ground
11	USB2_DP4	12	USB2_DN4
13	Ground	14	USB3_TX5_DP
15	USB3_TX5_DN	16	Ground
17	USB3_RX5_DP	18	USB3_RX5_DN
19	5V Dual	20	N/C

J2:Parallel Port Connector



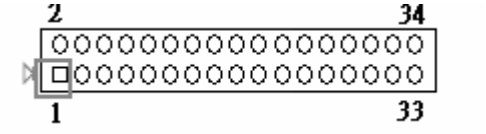
PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	2	Auto Form Feed#
3	Data0	4	Error#
5	Data1	6	Initialization#
7	Data2	8	Printer Select IN#
9	Data3	10	Ground
11	Data4	12	Ground
13	Data5	14	Ground
15	Data6	16	Ground
17	Data7	18	Ground
19	Acknowledge#	20	Ground
21	Busy	22	Ground
23	Paper Empty	24	Ground
25	Printer Select	26	NC

J6/J7: External USB Connector



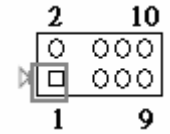
PIN No.	Signal Description	PIN No.	Signal Description
1	5V Dual	2	5V Dual
3	USB-	4	USB-
5	USB+	6	USB+
7	Ground	8	Ground
	Key(no pin)	10	N/C

J10:Floppy Interface



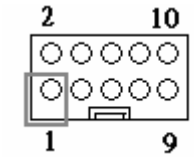
PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Density Select
3	Ground	4	N/C
5	N/C	6	N/C
7	Ground	8	Index#
9	Ground	10	Motor ENA#
11	Ground	12	N/C
13	Ground	14	Drive Select A#
15	Ground	16	N/C
17	Ground	18	Direction#
19	Ground	20	Step#
21	Ground	22	Write Data#
23	Ground	24	Write Gate#
25	Ground	26	Track 0#
27	Ground	28	Write Protect#
29	N/C	30	Read Data#
31	Ground	32	Head Select#
33	N/C	34	Disk Change#

J13: External PS/2 Keyboard/Mouse Connector



PIN No.	Signal Description	PIN No.	Signal Description
1	Mouse Data	2	Keyboard Data
3	N/C	4	N/C
5	Ground	6	Ground
7	PS2 Power	8	PS2 Power
9	Mouse Clock	10	Keyboard Clock

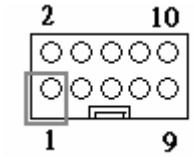
J14: COM2 Serial Port 2 Connector



PIN No.	Signal Description		
	RS-232	**RS-422**	**RS-485**
1	DCD (Data Carrier Detect)	TX-	DATA-
2	DSR (Data Set Ready)	N/C	N/C
3	RXD (Receive Data)	TX+	DATA+
4	RTS (Request to Send)	N/C	N/C
5	TXD (Transmit Data)	RX+	N/C
6	CTS (Clear to Send)	N/C	N/C
7	DTR (Data Terminal Ready)	RX-	N/C
8	RI (Ring Indicator)	N/C	N/C
9	Ground	GND	GND
10	N/C	N/C	N/C

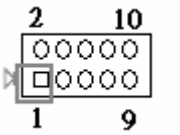
Note:
J14 (COM2) could be configurable as RS-232/422/485 with BIOS Setting

J15 : COM1 Serial Port 1 Connector



PIN NO.	Signal Description
1	DCD (Data Carrier Detect)
2	DSR (Data Set Ready)
3	RXD (Receive Data)
4	RTS (Request to Send)
5	TXD (Transmit Data)
6	CTS (Clear to Send)
7	DTR (Data Terminal Ready)
8	RI (Ring Indicator)
9	Ground
10	N/C

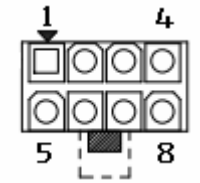
J17: General Purpose I/O Connector



PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	Ground	10	+5V

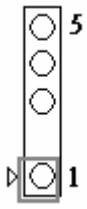
Note:
All General Purpose I/O ports can only apply to standard TTL ± 5% signal level (0V/5V), and each Fan

J19 :+12V POWER Connector



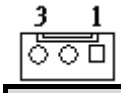
PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Ground
3	Ground	4	Ground
5	+12V	6	+12V
7	+12V	8	+12V

J23:SMBUS Connector



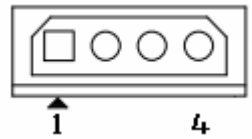
PIN NO.	Signal Description
1	SMBus_CLK
2	N/C
3	Ground
4	SMBus_DAT
5	+5V

J24: System Fan Connector



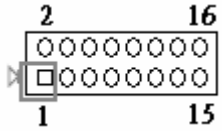
PIN NO.	Signal Description
1	Ground
2	Fan speed control
3	Fan on/off output

J26:POWER 4P CONNECTOR for USB POWER



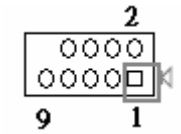
PIN NO.	Signal Description
1	N/C
2	Ground
3	Ground
4	+5V

J27:Front Panel Pin HDR



PIN No.	Signal Description	PIN No.	Signal Description
1	PWR_LED(+)	2	Speaker(+)
3	PWR_LED(-)	4	N/C
5	J22 LAN1_ACT(+)	6	N/C
7	J22 LAN1_ACT(-)	8	Speaker(-)
9	J21 LAN2_ACT(-)	10	NC
11	J21 LAN2_ACT(+)	12	NC
13	HDD_LED(+)	14	NC
15	HDD_LED(-)	16	NC

J28: Audio MIC/Line-in/Line-out Connector

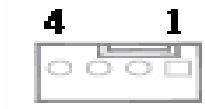


PIN No.	Signal Description	PIN No.	Signal Description
1	MIC with Reference Voltage	2	Analog Ground
3	Line-in Left Channel	4	Analog Ground
5	Line-in Right Channel	6	Analog Ground
7	Line-out Left Channel	8	Analog Ground
9	Line-out Right Channel	10	N/C

J29: DVI Connector

PIN No	Signal Description	PIN No	Signal Description	PIN No	Signal Description
1	D2-	9	D1-	17	D0-
2	D2+	10	D1+	18	D0+
3	GND	11	GND	19	GND
4	D4-(NC)	12	D3-(NC)	20	D5-(NC)
5	D4+(NC)	13	D3+(NC)	21	D5+(NC)
6	DDCCLK	14	VCC	22	GND
7	DDCDATA	15	GND	23	CLK+
8	V_SYNC	16	HPDET	24	CLK-
C1	Red	CG1	AGND		
C2	Green	CG2	AGND		
C3	Blue				
C4	H_SYNC				
C5	A_GND				
C6	A_GND				

J30: CPU Fan Connector



PIN NO.	Signal Description
1	Ground
2	+12V
3	Fan on/off output
4	Fan Speed control

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® Haswell processor

LGA-1150 CPU Socket

Pin1 corner of the CPU Socket

LGA-1150 CPU

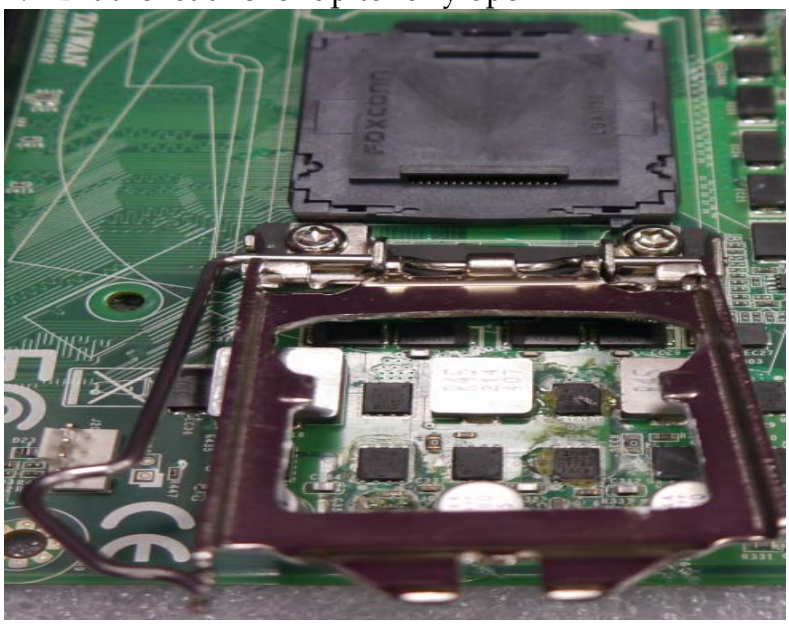
Yellow Triangle Pin1 of the CPU

Please remember to locate the alignment keys on the CPU socket of the motherboard and the notches on the CPU.

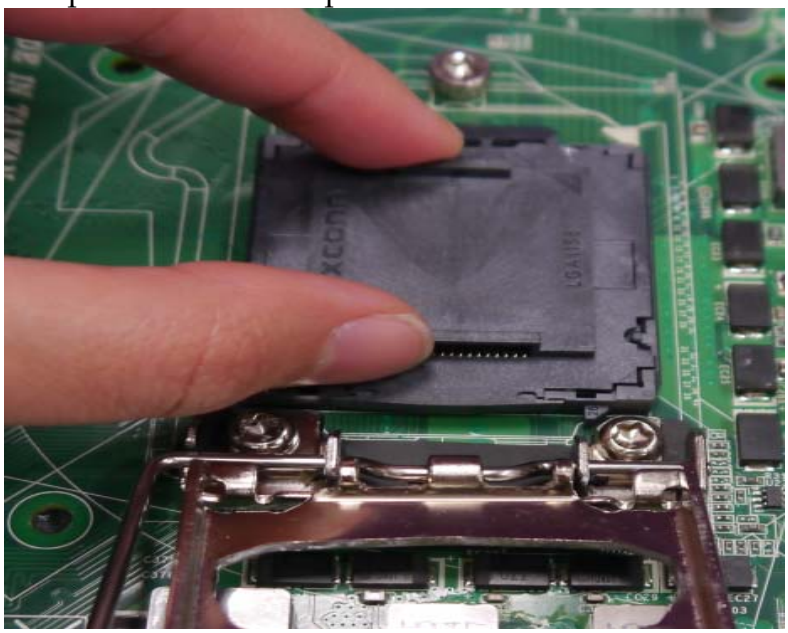
LGA-1150 CPU Installation Steps
Before install the CPU, please make sure to turn off the power first!!

1. Open the load lever.

2. Lift the load lever up to fully open



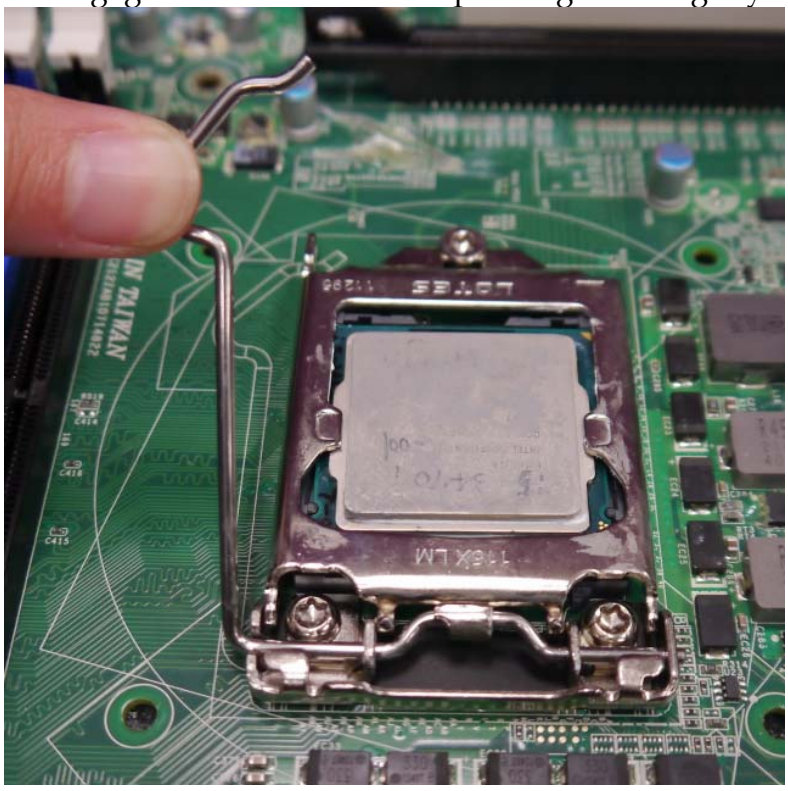
3. Remove the plastic cap on the CPU socket. Before you install the CPU, always cover it to protect the socket pin.



4. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Note that alignment keys are matched.

5. Make sure the CPU has been seated well into the socket. If not, take out the CPU and reinstall.

6. Engage the load lever while pressing down lightly onto the load plate.



7. Push the CPU socket lever back into its locked position.

3.2 Main Memory

ROBO-8112VG2AR provide 2 x240 pin DIMM sockets (Dual Channel) which supports Dual channel 1333/1600 DDR3-SDRAM as main memory, non-register function. ROBO-8112VG2AR just supports ECC and Non-ECC memory. The maximum memory can be up to 16GB. Memory clock and related settings can be detected by BIOS via SPD interface.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be set to either one double-sided DIMM in one DIMM socket or two single-sided DIMM in both sockets.

Beware of the connection and lock integrity from memory module to socket. Inserting improperly it will affect the system reliability.

Before locking, make sure that all modules have been fully inserted into the card slots

Note:
To insure the system stability, please do not change any of DRAM parameters in BIOS setup to modify system the performance without acquired technical information.

3.3 Installing the Single Board Computer

To install your ROBO-8112VG2AR into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module at right position
Step 3 : Place ROBO-8112VG2AR into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING
Please ensure that SBC is properly inserted and fixed by mechanism.

Note
Please refer to section 3.3.1 to 3.3.7 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

ROBO-8112VG2AR uses state-of-art Intel® Panther Point chipset. It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for previous Windows Operating Systems such as Windows XP, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in ROBO-8112VG2AR CD-title.
Moreover, if using some old OS, the driver may not be supported anymore. We recommend to change the different OS to comply with this new chipset.

3.3.2 Intel® Integrated Graphics Controller

With latest Intel® Core Haswell series structure, ROBO-8112VG2AR Intel® HD Graphic is built in with CPU. Therefore 2nd Generation Core and 3nd Generation Core CPUs provide HD integrated Graphic support sharing on board physical memories. ROBO-8112VG2AR has both internal VGA & DVI interface. This combination makes ROBO-8112VG2AR an excellent piece of multimedia hardware
With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI-Express Graphic card can take over the system display.

※To use Intel® Integrated HD Graphic, it's required to choose the CPU which has Integrated Graphic built-in. Otherwise there will be no display whatsoever.

3.3.3 Intel® PROSet Gigabit Ethernet Controlle

Drivers Support

Please find Intel® WG1217LM and WG1210AT LAN driver in /Ethernet directory of ROBO-8112VG2AR CD-title. The driver supports Windows Win7 64-bits.

3.3.4 Audio Controller

Please find Intel® High Definition Audio driver form ROBO-8112VG2AR CD-title. The driver supports Windows Win7 64-bits.

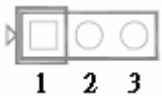
3.3.5 Intel® Active Management Technology (Intel® AMT)

Please find the latest Intel®AMT 9.0 driver from ROBO-8112VG2AR CD-title. The driver supports Windows Win7 64-bits.

3.4 Clear CMOS Operation

JP2: CLEAR CMOS

PIN NO.	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents



3.5 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.
ROBO-8112VG2AR allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process.
A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.
The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed. Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to IT8728F/CXS data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)

2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)
Below are some example codes, which demonstrate the use of WDT.

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>

#define SIO_Port 0x2E
#define  SIO_Port2          0x4E
#define GPIO_LDN          0x07

void Enter_IT872x_SIO() {
        outportb(SIO_Port, 0x87);
        outportb(SIO_Port, 0x01);
        outportb(SIO_Port, 0x55);
        outportb(SIO_Port, 0x55);

}
```

```
void Set_LDN(unsigned char LDN) {
        outportb(SIO_Port, 0x07);
        outportb(SIO_Port+1, LDN);
        printf("LDN=%x\n", LDN);
}

void Set_Register(unsigned char offset, unsigned char value) {
        outportb(SIO_Port, offset);
        outportb(SIO_Port+1, value);
        printf("Write offset:%x = %x\n", offset, value);
}

int main(void) {

        printf("test string\n");
        Enter_IT872x_SIO();
        Set_LDN(GPIO_LDN);

        Set_Register(0x72, 0xC0);
        Set_Register(0x73, 0x05);
        printf("System will reset in 5 seconds\n");

        return 0;
}
```

3.6 GPIO

The ROBO-8112VG2AR provides 8 programmable input or output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

J17: General Purpose I/O Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	Ground	10	+5V

```
#include <stdio.h>
#include <conio.h>
#include <stdlib.h>

#define SIO_Port 0x2E
#define  SIO_Port2          0x4E
#define GPIO_LDN          0x07
#define GPIO_Base         0x0A00

//Enter SIO
void Enter_IT872x_SIO() {
        outp(SIO_Port, 0x87);
        outp(SIO_Port, 0x01);
        outp(SIO_Port, 0x55);
        outp(SIO_Port, 0x55);

}

//Select LDN
void Set_LDN(unsigned char LDN) {
        outp(SIO_Port, 0x07);
        outp(SIO_Port+1, LDN);
        //printf("LDN=%x\n", LDN);
}

//Set register offset to Value
void Set_Register(unsigned char offset, unsigned char value) {
        outp(SIO_Port, offset);
```

```
	outp(SIO_Port+1, value);
	//printf("Write offset:%x = %x\n", offset, value);
}

//Or register
void Or_Register(unsigned char offset, unsigned char value) {
	outp(SIO_Port, offset);
	outp(SIO_Port+1, inp(SIO_Port+1) | value);
	//printf("Write offset:%x = %x\n", offset, value);
}

//And register
void And_Register(unsigned char offset, unsigned char value) {
	outp(SIO_Port, offset);
	outp(SIO_Port+1, inp(SIO_Port+1) & value);
	//printf("Write offset:%x = %x\n", offset, value);
}
int main(void) {

	int result;
	printf("ROBO-8112 GPIO Test:\n");

	//pin1 =11
	//pin3 =12
	//pin5 =47
	//pin7 =50


	//pin2 =14
	//pin4 =35
	//pin6 =36
	//pin8 =37


	Enter_IT872x_SIO();
	Set_LDN(GPIO_LDN);

	//Enable GPIO
	//Or_Register(0xC0,0x46) //11,12,14
	//Or_Register(0xC2,0xE0) //35,36,37
	//Or_Register(0xC3,0x80) //47
	//Or_Register(0xC4,0x01) //50

	//Set Output
	Or_Register(0xC8,0x06);    //11,12
	Or_Register(0xCB,0x80);    //47
```

```
Or_Register(0xCC,0x01);    //50

//Set Input
And_Register(0xC8,0xEF); //14
And_Register(0xCA,0x1F); //35,36,37

//output high
outp(GPIO_Base+0,0x06);  //11,12
outp(GPIO_Base+3,0x80);  //47
outp(GPIO_Base+4,0x01);  //50

result=1;
if ((inp(GPIO_Base+0)&0x10)!=0x10) result=0;
if ((inp(GPIO_Base+2)&0xE0)!=0xE0) result=0;

if (result==0){

        printf("Test fail!!\n");

        return 1;
}


//output low
outp(GPIO_Base+0,inp(GPIO_Base+0)&0xF9);        //11,12
outp(GPIO_Base+3,inp(GPIO_Base+3)&0x7F);        //47
outp(GPIO_Base+4,inp(GPIO_Base+4)&0xFE);        //50

result=1;
if ((inp(GPIO_Base+0)&0x10)!=0x00) result=0;
if ((inp(GPIO_Base+2)&0xE0)!=0x00) result=0;

if (result==0){

        printf("Test fail!!\n");
        return 1;

}

////////////////////////////////////////////////

//Set Input
And_Register(0xC8,0xF9);  //11,12
And_Register(0xCB,0x7F); //47
And_Register(0xCC,0xFE);//50
```

```
        //Set output
        Or_Register(0xC8,0x10);    //14
        Or_Register(0xCA,0xE0);    //35,36,37

        //output high
        outp(GPIO_Base+0,0x10);  //14
        outp(GPIO_Base+2,0xE0);  //35,36,37

        result=1;
        if ((inp(GPIO_Base+0)&0x06)!=0x06) result=0; //11,12
        if ((inp(GPIO_Base+3)&0x80)!=0x80) result=0; //47
        if ((inp(GPIO_Base+4)&0x01)!=0x01) result=0; //50

        if (result==0){

                printf("Test fail!!\n");

                return 1;
        }

        //output low
        outp(GPIO_Base+0,inp(GPIO_Base+0)&0xEF);          //14
        outp(GPIO_Base+2,inp(GPIO_Base+2)&0x1F);          //35,36,37

        result=1;
        if ((inp(GPIO_Base+0)&0x06)!=0x00) result=0; //11,12
        if ((inp(GPIO_Base+3)&0x80)!=0x00) result=0; //47
        if ((inp(GPIO_Base+4)&0x01)!=0x00) result=0; //50

        if (result==0){

                printf("Test fail!!\n");
                return 1;

        }

        //getchar ();

        printf("Test Pass!!\n");
        return 1;
}
```

Chapter 4
BIOS Setup Information

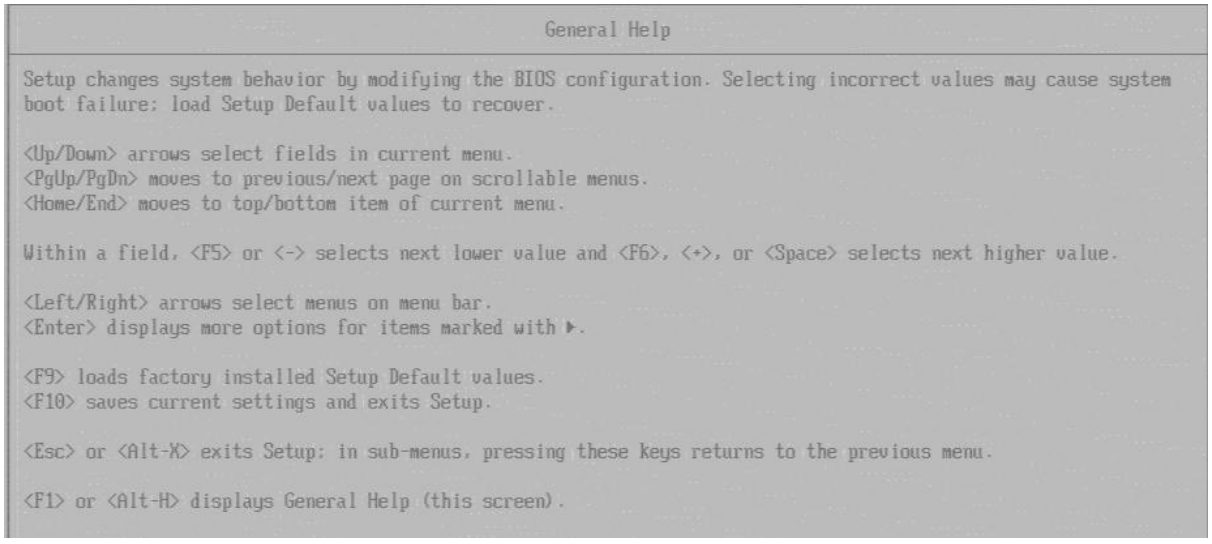
ROBO-8112VG2AR is equipped with the Phoenix BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, ROBO-8112VG2AR communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup - Launch System Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <F2> key will enter BIOS setup screen.

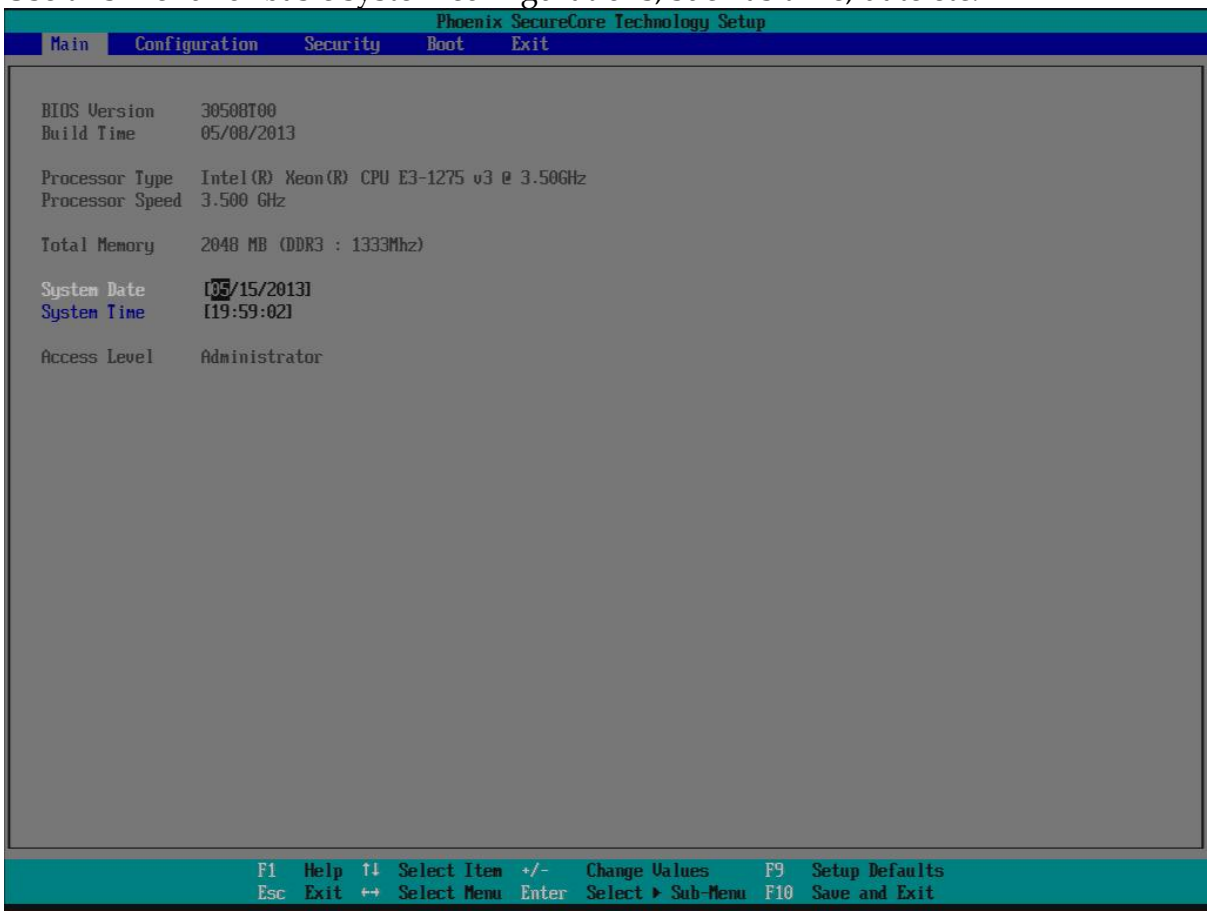
Press <F2> to enter SETUP
If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

Press <F1> to Run General Help or Resume
The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.


Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
BIOS Version 30508T00
Build Time 05/08/2013
Processor Type Intel(R) Xeon(R) CPU E3-1275 v3 @ 3.50GHz
Processor Speed 3.500 GHz
Total Memory 2048 MB (DDR3 : 1333Mhz)
System Date [05/15/2013]
System Time [19:59:02]
Access Level Administrator
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

System Date

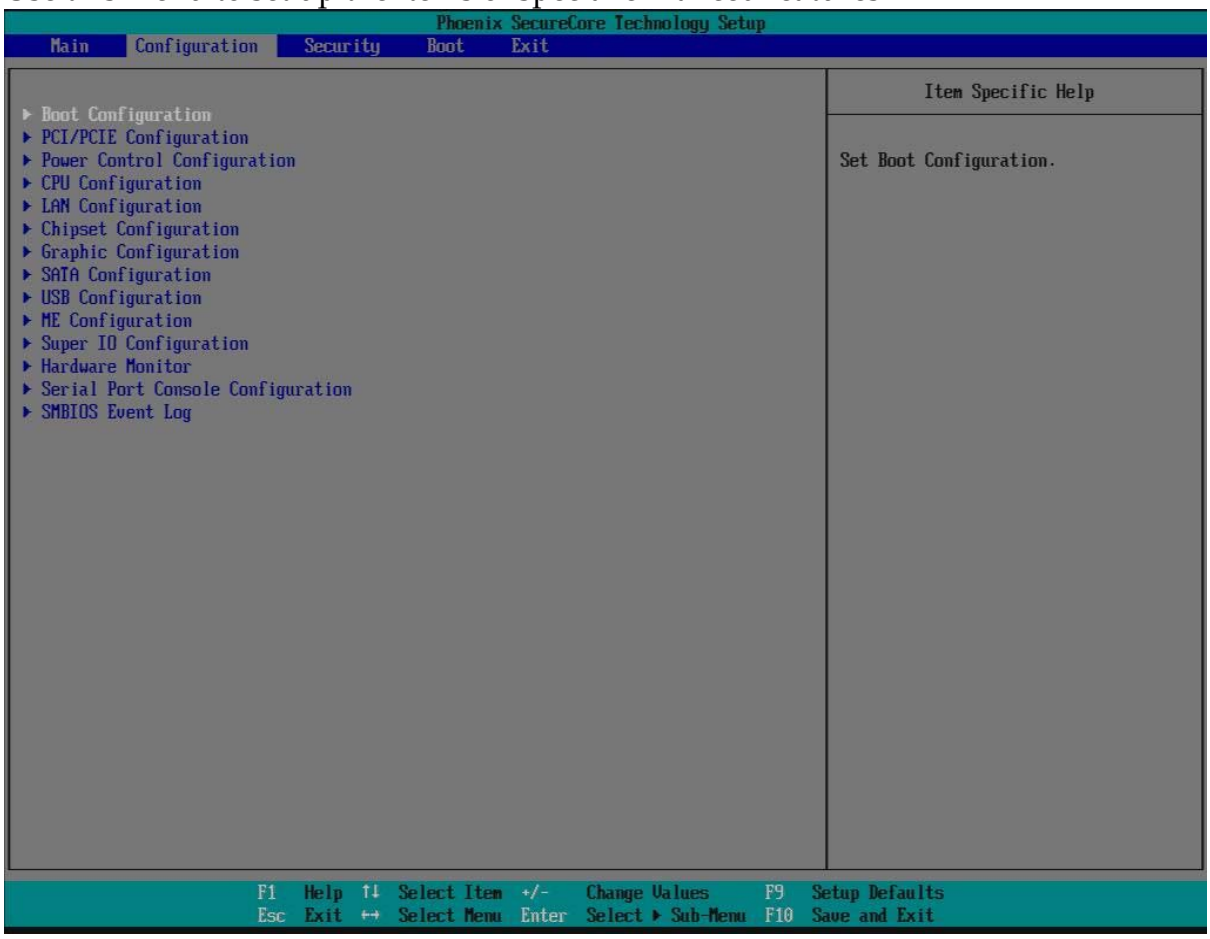
The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

System Time

The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

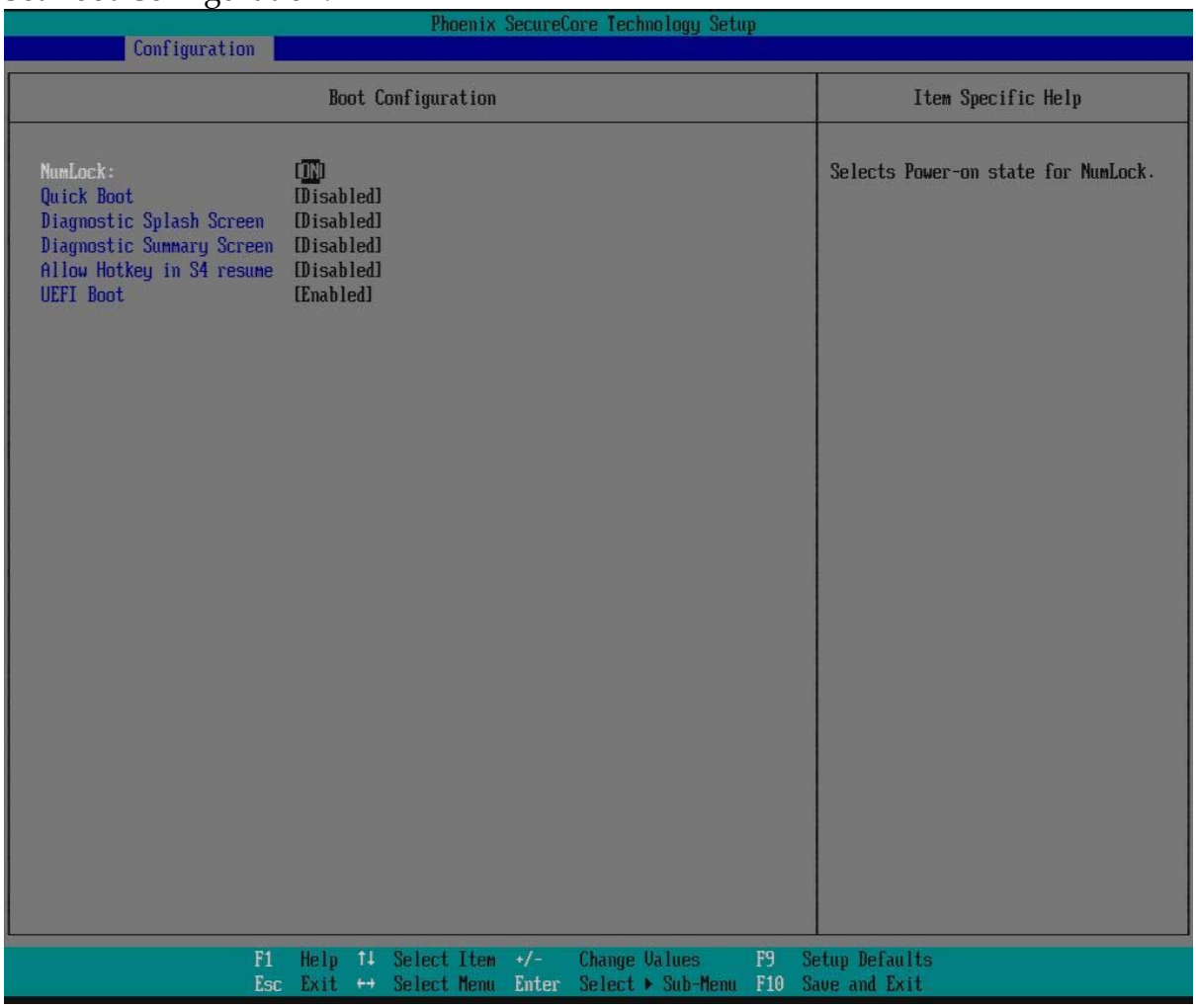
4.3 Configuration

Use this menu to set up the items of special enhanced features



Boot Configuration

Set Boot Configuration.


Phoenix SecureCore Technology Setup
Configuration
Boot Configuration
Item Specific Help
NumLock: [ON]
Quick Boot [Disabled]
Diagnostic Splash Screen [Disabled]
Diagnostic Summary Screen [Disabled]
Allow Hotkey in S4 resume [Disabled]
UEFI Boot [Enabled]
Selects Power-on state for NumLock.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

NumLock:

Selects Power-on state for NumLock.
Choices: OFF, ON.

Quick Boot

Enable/Disable quick boot.
Choices: Disabled, Enabled.

Diagnostic Splash Screen

If you select 'Enabled' the diagnostic splash screen always displays during boot. If you select 'Disabled' the diagnostic splash screen does not displays unless you press HOTKEY during boot.
Choices: Disabled, Enabled.

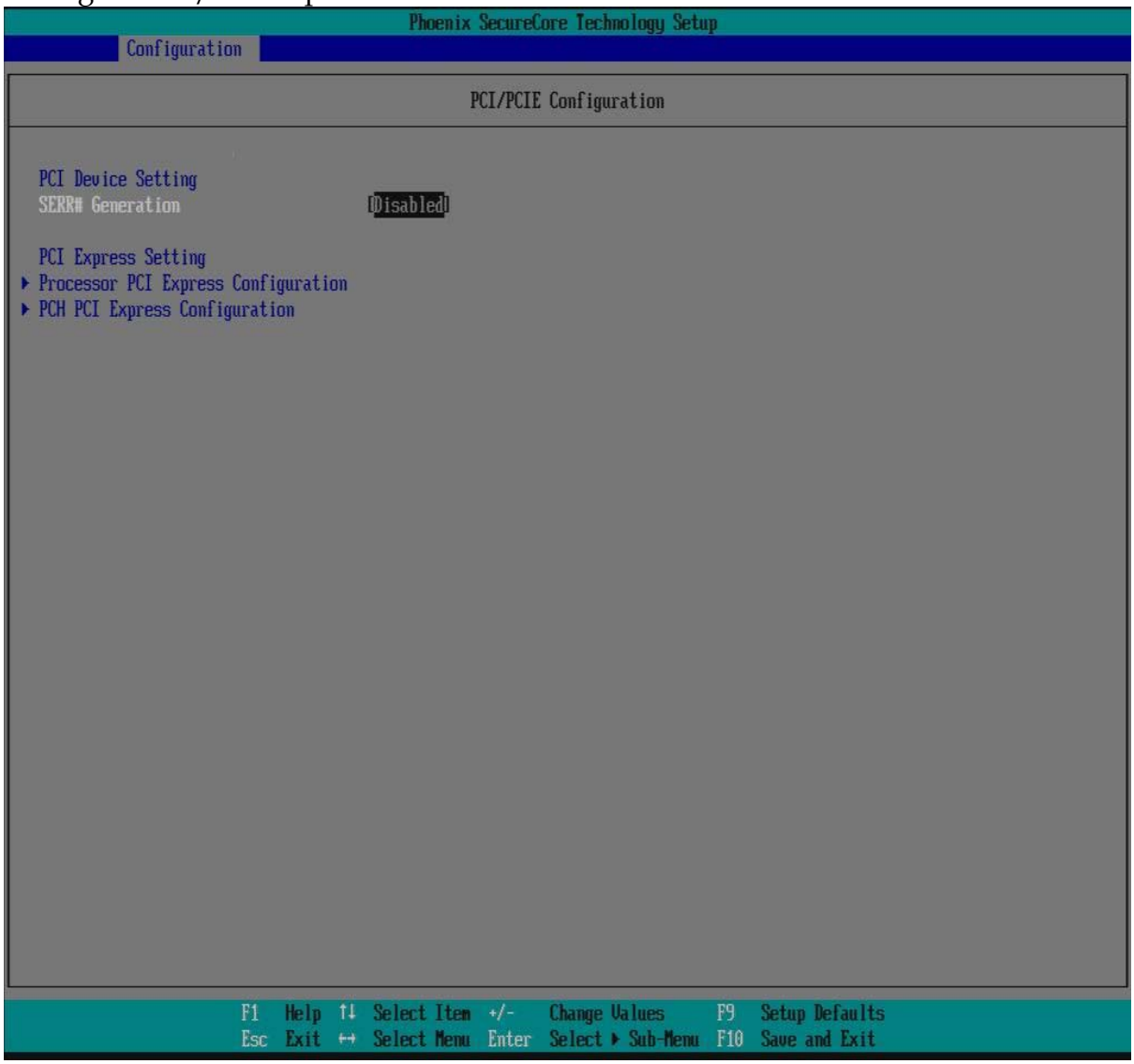
Diagnostic Summary Screen

Display the Diagnostic summary screen during boot.
Choices: Disabled, Enabled.

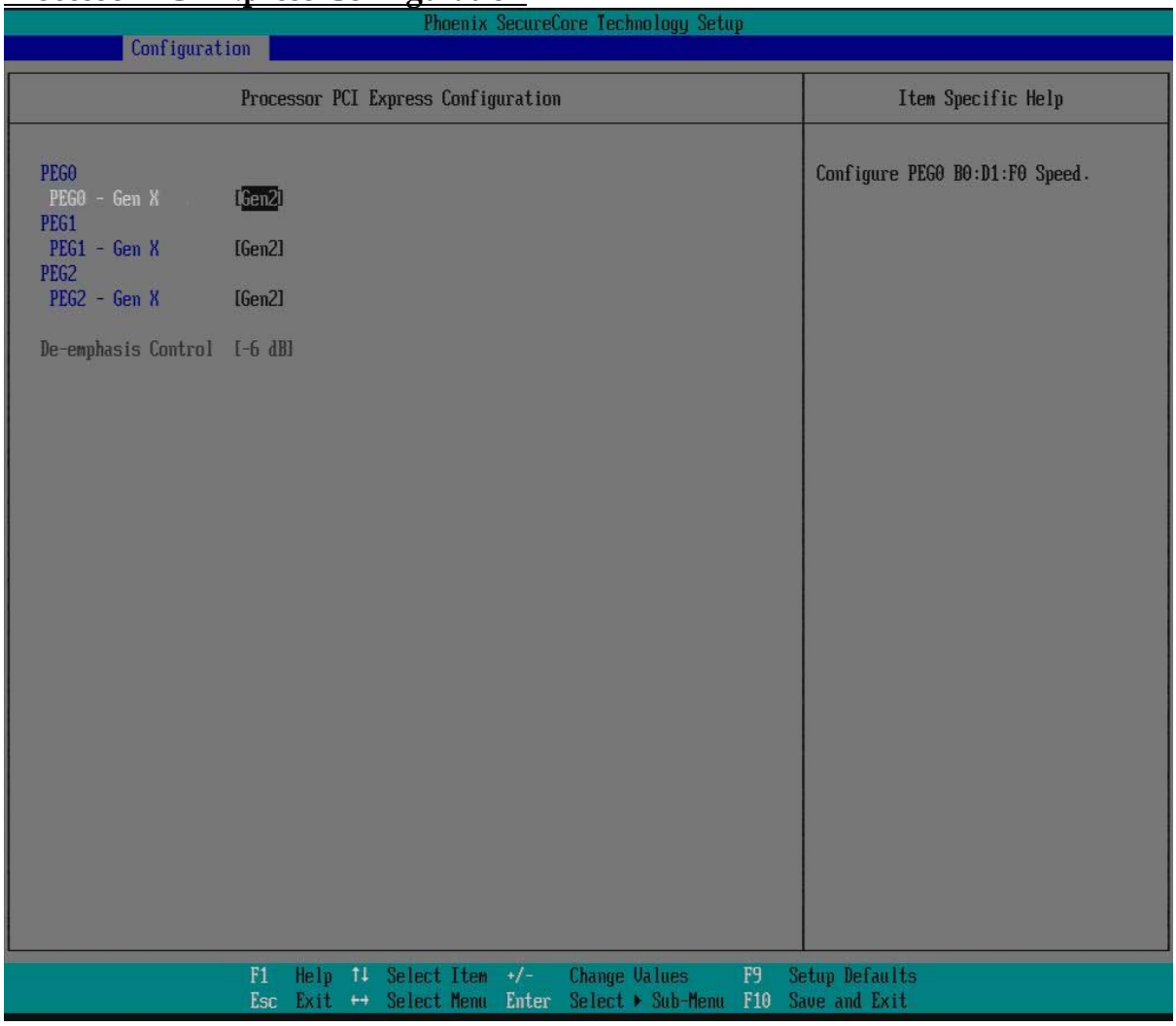
Allow Hotkey in S4 resume
Enable hotkey detection when system resuming from Hibernate state.
Choices: Disabled, Enabled.

UEFI Boot
Enable the UEFI boot.
Choices: Disabled, Enabled.

PCI/PCIE Configuration
Configure PCI/PCI Express slot.


Phoenix SecureCore Technology Setup
Configuration
PCI/PCIE Configuration
PCI Device Setting
SERR# Generation
[Disabled]
PCI Express Setting
Processor PCI Express Configuration
PCH PCI Express Configuration
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Processor PCI Express Configuration


Phoenix SecureCore Technology Setup
Configuration
Processor PCI Express Configuration
Item Specific Help
PEG0
PEG0 - Gen X [Gen2]
PEG1
PEG1 - Gen X [Gen2]
PEG2
PEG2 - Gen X [Gen2]
De-emphasis Control [-6 dB]
Configure PEG0 B0:D1:F0 Speed.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

FEG0 PEG0 – Gen X

Configure PFG0 B0:D0:F0 Speed.
Choices: Gen1, Gen2, Gen3

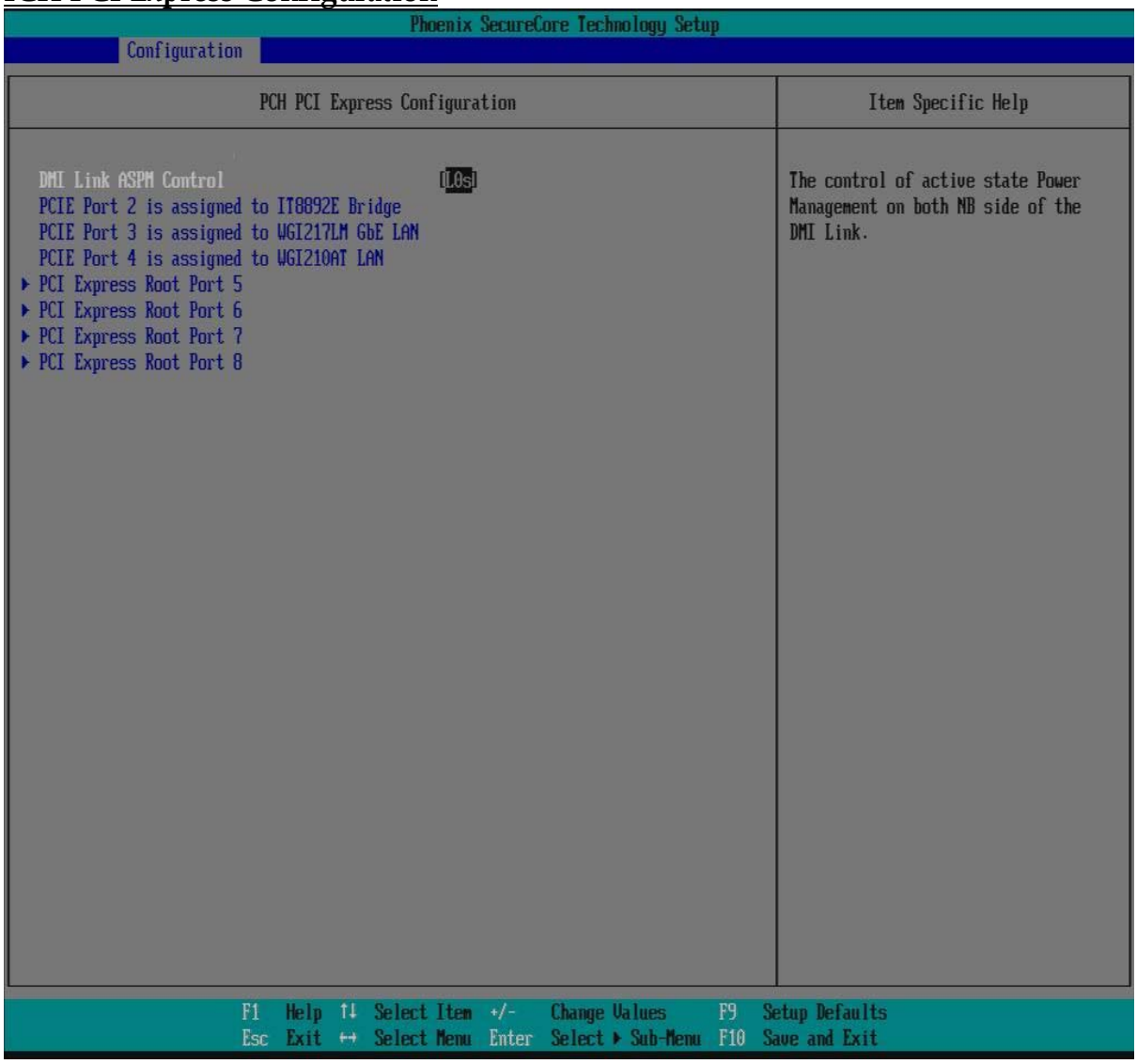
FEG1 PEG1 – Gen X

Configure PFG1 B0:D0:F1 Speed.
Choices: Gen1, Gen2, Gen3

FEG2 PEG2 – Gen X

Configure PFG2 B0:D0:F2 Speed.
Choices: Gen1, Gen2, Gen3

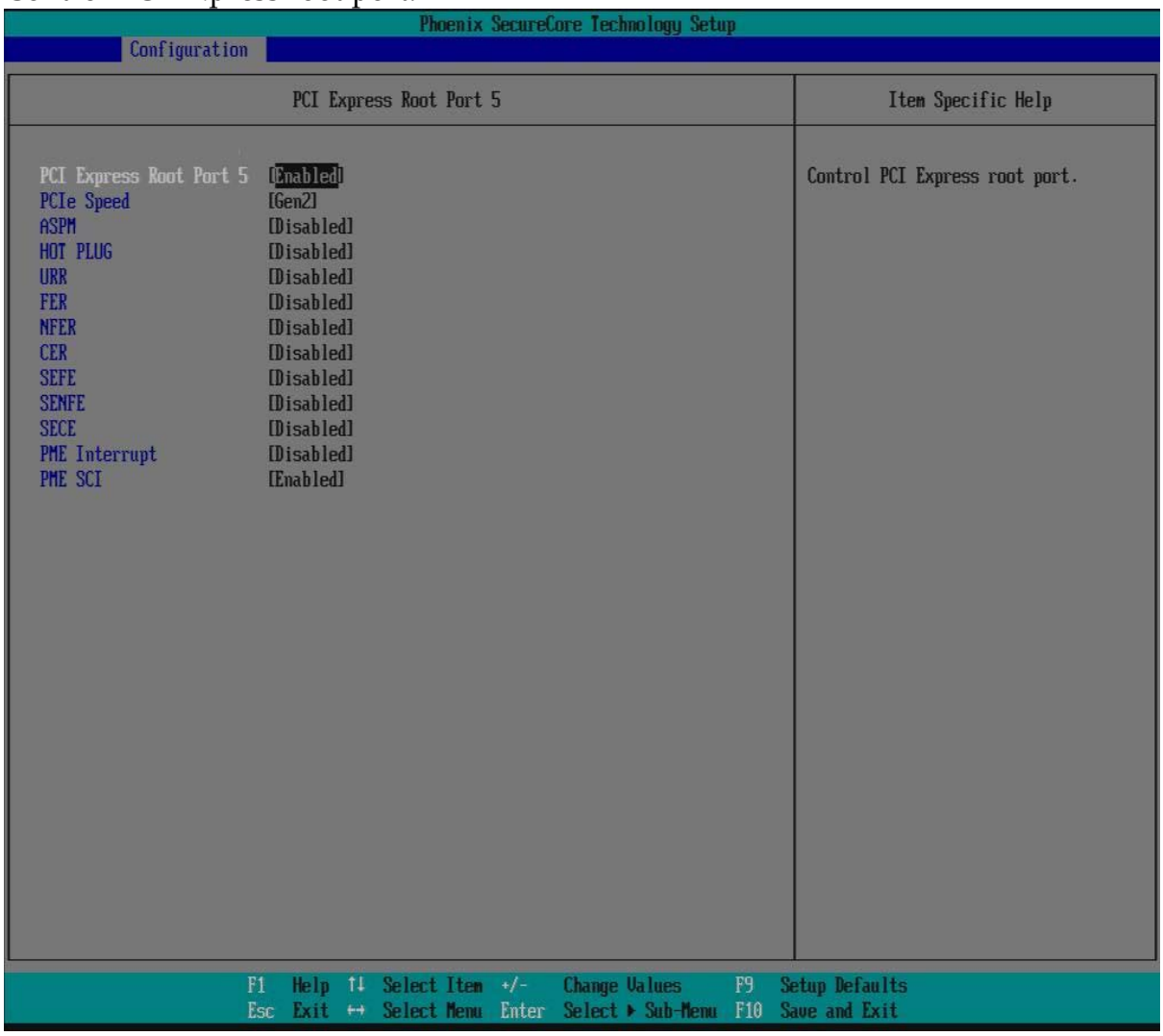
ICH PCI Express Configuration


Phoenix SecureCore Technology Setup
Configuration
PCH PCI Express Configuration
Item Specific Help
DMI Link ASPM Control [L0s]
PCIE Port 2 is assigned to IT8892E Bridge
PCIE Port 3 is assigned to WGI217LM GbE LAN
PCIE Port 4 is assigned to WGI210AT LAN
PCI Express Root Port 5
PCI Express Root Port 6
PCI Express Root Port 7
PCI Express Root Port 8
The control of active state Power Management on both NB side of the DMI Link.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

DMI Link ASPM Control

The control of active state Power Management on both NB side of the DMI Link. Choices: Disabled, L0s, L1, L0sL1.

PCI Express Root Port 5~8
Control PCI Express root port.



PCI Express Root Port 5~8
Control PCI Express root port.
Choices: Disabled, Enabled.

PCIe Speed
Select PCIe Speed to Gen1 or Gen2
Choices: Auto, Gen1, Gen2.

ASPM
Control PCIe Active State Power Management settings.
Choices: Disabled, L0S, L1, L0S And L1, Auto.

HOT PLUG
PCI Express Hot Plug Enabled/Disabled.
Choices: Disabled, Enabled.

URR
PCI Express Unsupported Request Reporting Enable/Disable.
Choices: Disabled, Enabled.

FER
PCI Express Device Fatal Error Reporting Enable/Disable.
Choices: Disabled, Enabled.

NFER
PCI Express Device Non-Fatal Error Reporting Enable/Disable.
Choices: Disabled, Enabled.

CER
PCI Express Device Correctable Error Reporting Enable/Disable.
Choices: Disabled, Enabled.

SEFE
Root PCI Express System Error on Fatal Error Enable/Disable.
Choices: Disabled, Enabled.

SENFE
Root PCI Express System Error on Non-Fatal Error Enable/Disable.
Choices: Disabled, Enabled.

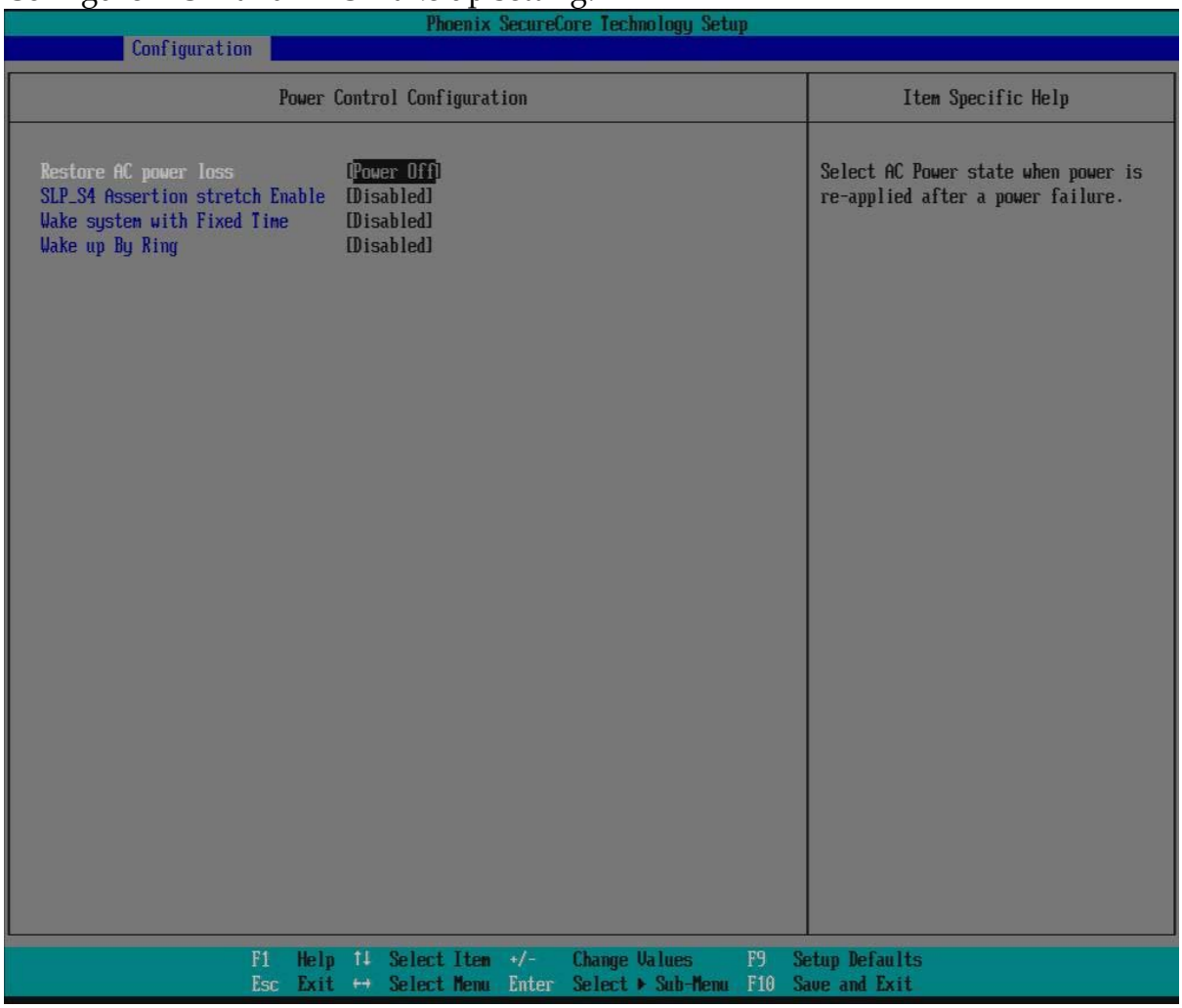
SECE
Root PCI Express System Error on Correctable Error Enable/Disable.
Choices: Disabled, Enabled.

PME Interrupt
Root PCI Express PME Interrupt Enable/Disable.
Choices: Disabled, Enabled.

PME SCI
PCI Express PME SCI
Choices: Disabled, Enabled.

Power Control Configuration

Configure ACPI and RTC wake up setting.


Phoenix SecureCore Technology Setup
Configuration
Power Control Configuration
Item Specific Help
Restore AC power loss [Power Off]
SLP_S4 Assertion stretch Enable [Disabled]
Wake system with Fixed Time [Disabled]
Wake up By Ring [Disabled]
Select AC Power state when power is re-applied after a power failure.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Restore AC Power Loss

Select AC Power state when power is re-applied after a power failure.
Choices: Power Off, Power On, Last State.

SLP_S4 Assertion stretch Enable

Choices: Disabled, Enabled

Wake system with Fixed Time

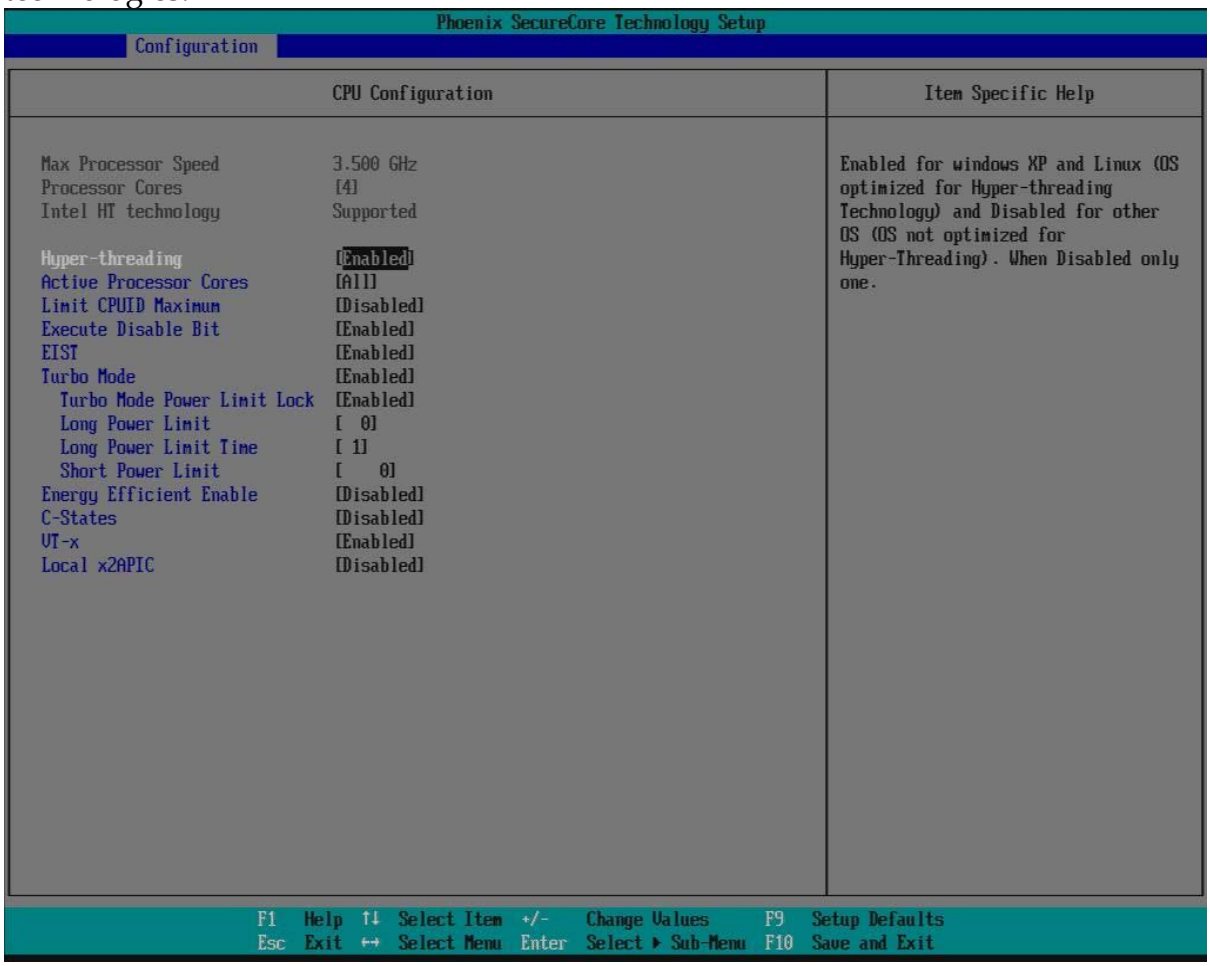
Enable or disable system wake on alarm event. When Enabled, system will wake on the hr::min::sec specified.
Choices: Disabled, Enabled

Wake up By Ring

Choices: Enabled, Disabled.

CPU configuration

Configure the specific active core(s) and advanced processor management technologies.


Phoenix SecureCore Technology Setup
Configuration
CPU Configuration
Item Specific Help
Max Processor Speed 3.500 GHz
Processor Cores [4]
Intel HT technology Supported
Hyper-threading [Enabled]
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
EIST [Enabled]
Turbo Mode [Enabled]
Turbo Mode Power Limit Lock [Enabled]
Long Power Limit [0]
Long Power Limit Time [1]
Short Power Limit [0]
Energy Efficient Enable [Disabled]
C-States [Disabled]
VT-x [Enabled]
Local x2APIC [Disabled]
Enabled for windows XP and Linux (OS optimized for Hyper-threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading). When Disabled only one.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Hyper-Threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one.
Choices: Disabled, Enabled.

Active Processor Cores

Select the number of physical cores to enable in each processor package.
Choices: All, 1.

Limit CPUID Maximum

Disabled for Windows XP.
Choices: Disabled, Enabled.

Execute Disabled Bit

Enabled Execute Disabled functionality. Also known as Data Execution Prevention (DEP).
Choices: Disabled, Enabled.

EIST
Choices: Disabled, Enabled.

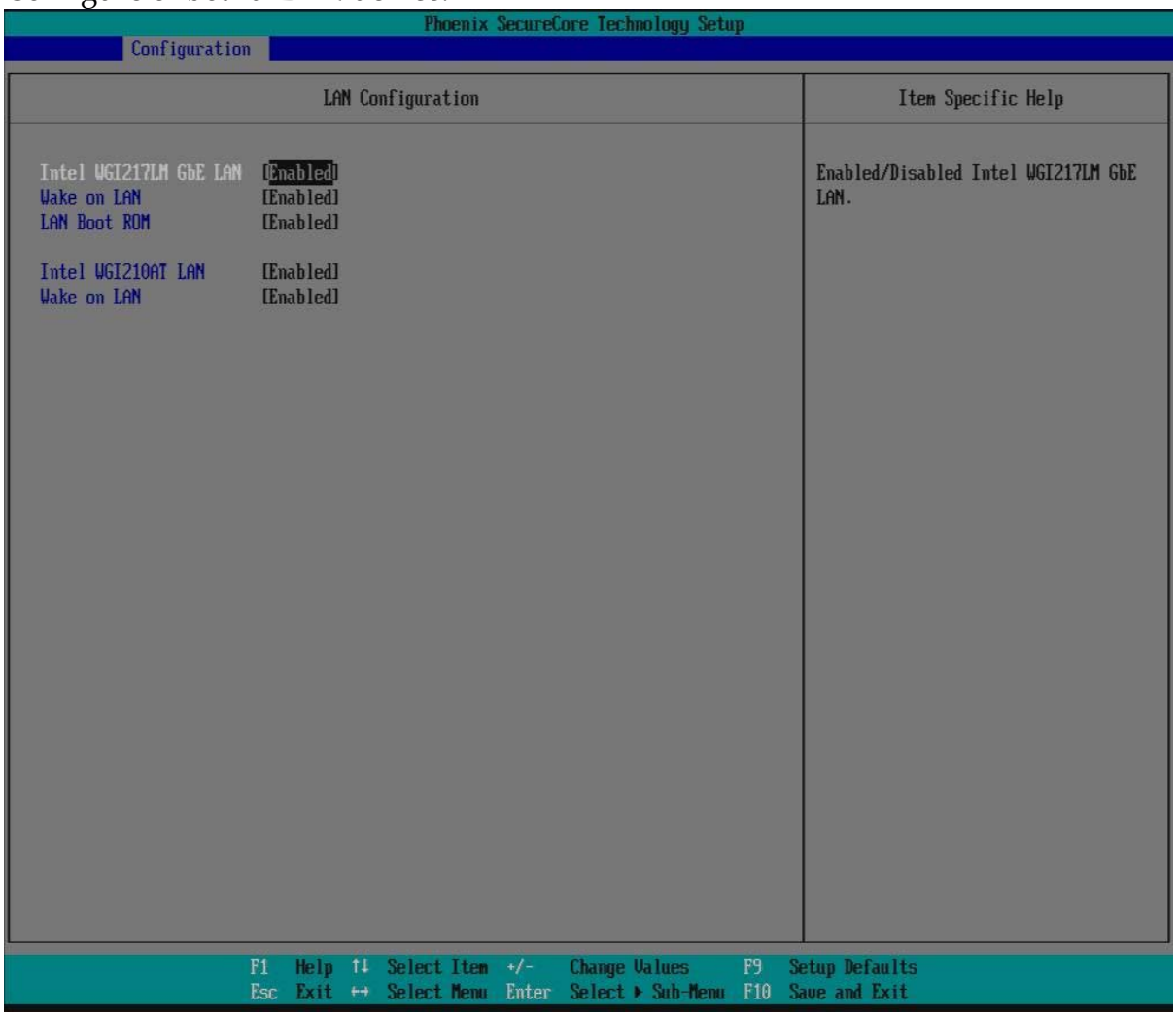
Turbo Mode
Choices: Disabled, Enabled.

C-States
Choices: Disabled, Enabled.

VT-x
When enabled, a VWM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Choices: Disabled, Enabled.

Local x2APIC
Choices: Disabled, Enabled.

LAN Configuration
Configure onboard LAN device.


Phoenix SecureCore Technology Setup
Configuration
LAN Configuration
Item Specific Help
Intel WGI217LM GbE LAN [Enabled]
Wake on LAN [Enabled]
LAN Boot ROM [Enabled]
Intel WGI210AT LAN [Enabled]
Wake on LAN [Enabled]
Enabled/Disabled Intel WGI217LM GbE LAN.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Intel WG1217LM GbE LAN
Enabled/Disabled Intel WG1217-LM GbE LAN.
Choices: Disabled, Enabled.

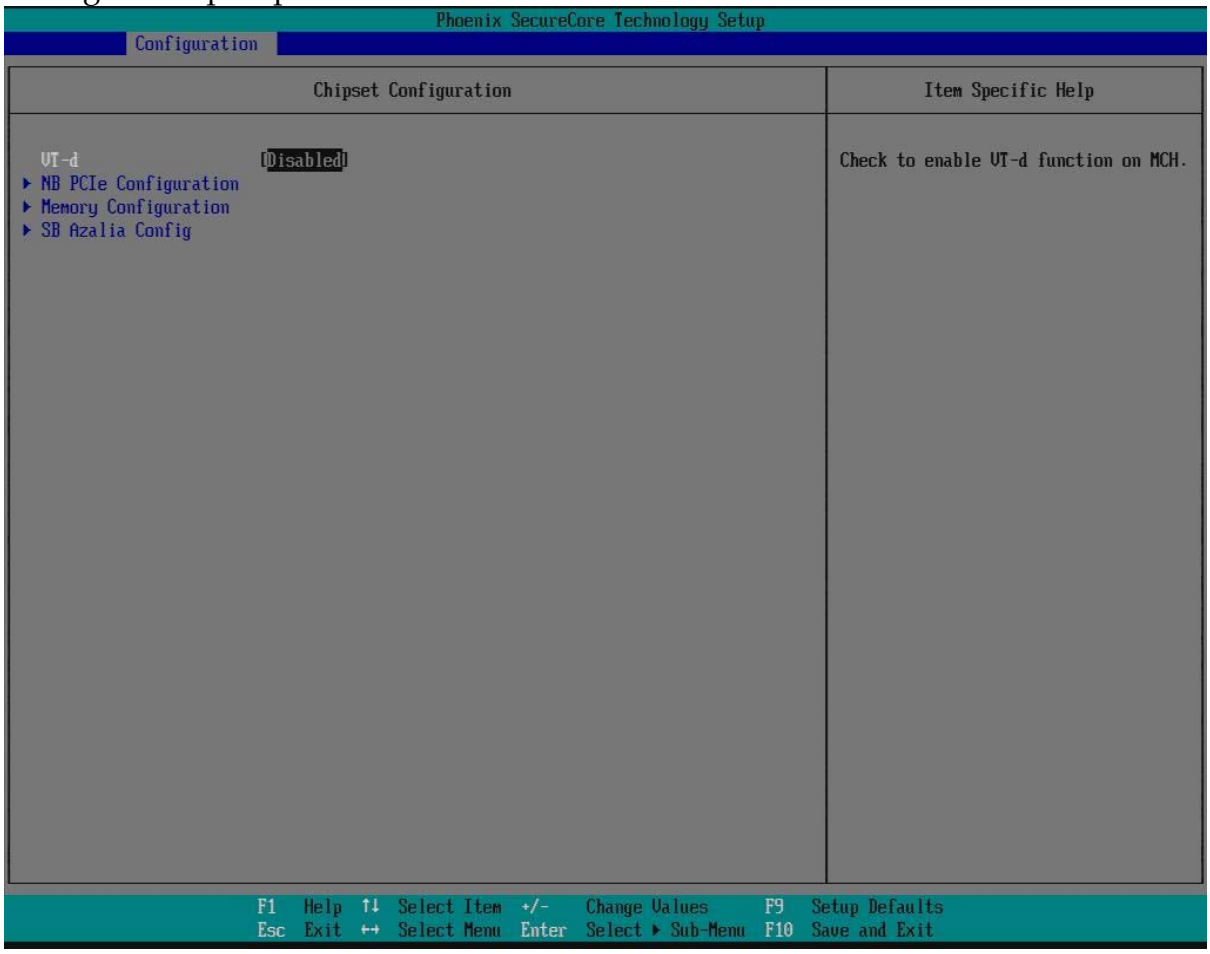
Wake on LAN
Enabled/Disabled Wake on LAN Function.
Choices: Disabled, Enabled.

LAN Boot ROM
Control LAN Boot ROM (PXE) function.
Choices: Disabled, Enabled.

Intel WG1210AT GbE LAN
Enabled/Disabled Intel WG1210AT LAN.
Choices: Disabled, Enabled.

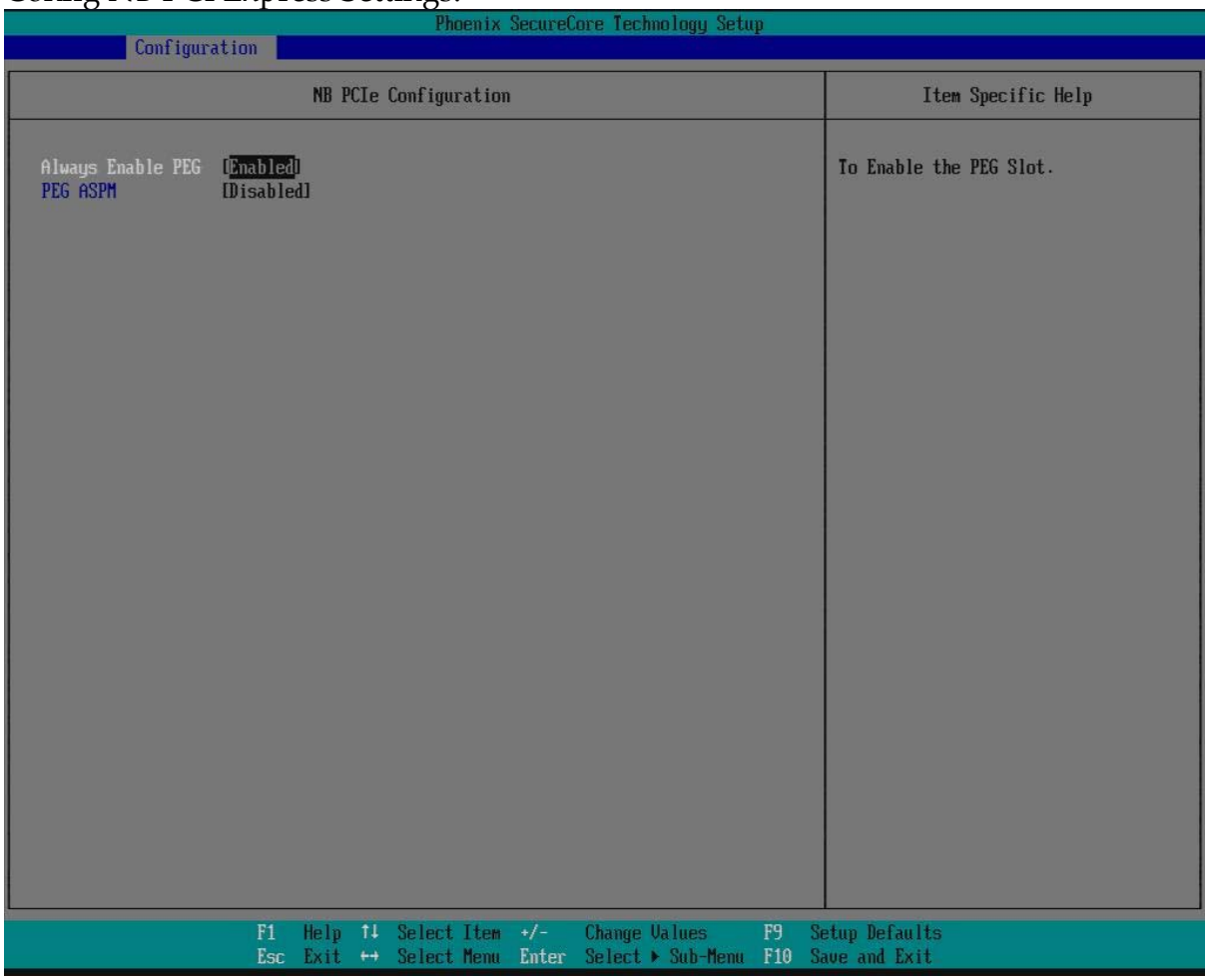
Wake on LAN
Enabled/Disabled Wake on LAN Function.
Choices: Disabled, Enabled.

Chipset Configuration
Configure Chipset provide feature.


Phoenix SecureCore Technology Setup
Configuration
Chipset Configuration
Item Specific Help
VT-d [Disabled]
Check to enable VT-d function on MCH.
NB PCIe Configuration
Memory Configuration
SB Azalia Config
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

VT-d
Check to enable VT-d function on MCH.
Choices: Disabled, Enabled.

NB PCIe Configuration
Config NB PCI Express Settings.

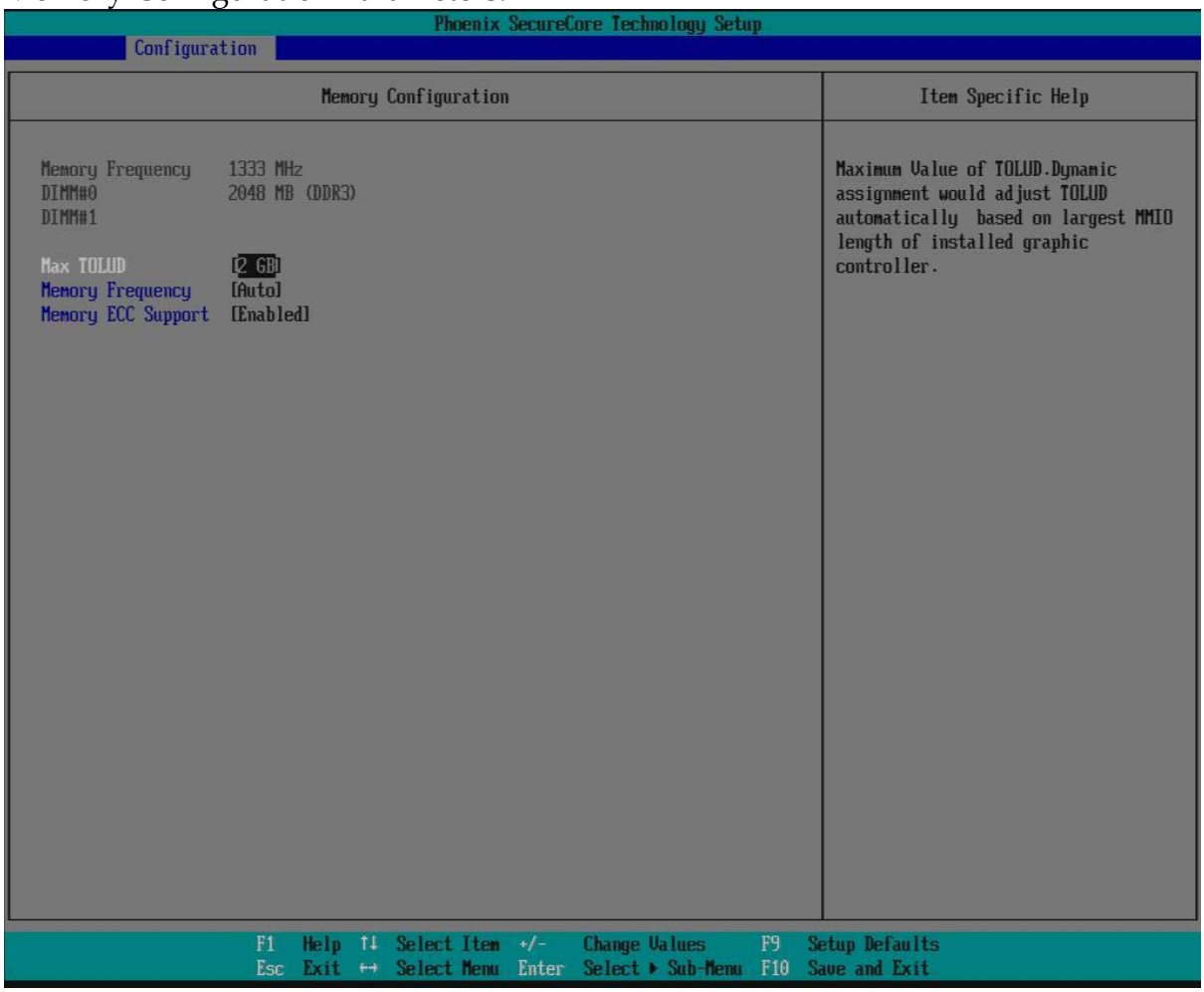

Phoenix SecureCore Technology Setup
Configuration
NB PCIe Configuration
Item Specific Help
Always Enable PEG [Enabled]
PEG ASPM [Disabled]
To Enable the PEG Slot.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Always Enable PEG
To Enable the PEG Slot.
Choices: Disabled, Enabled.

PEG ASPM
Control ASPM Support for the PEG Device. This has mp effect if PEF is not the current active sevice.
Choices: Disabled, Auto, ASPM L0s, ASPM L1, ASPM L0sL1.

Memory Configuration

Memory Configuration Parameters.


Phoenix SecureCore Technology Setup
Configuration
Memory Configuration
Item Specific Help
Memory Frequency 1333 MHz
DIMM#0 2048 MB (DDR3)
DIMM#1
Max TOLUD [2 GB]
Memory Frequency [Auto]
Memory ECC Support [Enabled]
Maximum Value of TOLUD.Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Max TOLUD

Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.
Choices: 1GB, 1.25GB, 1.5GB, 1.75GB, 2GB, 2.25GB, 2.5GB, 2.75GB, 3GB, 3.25GB.

Memory Frequency

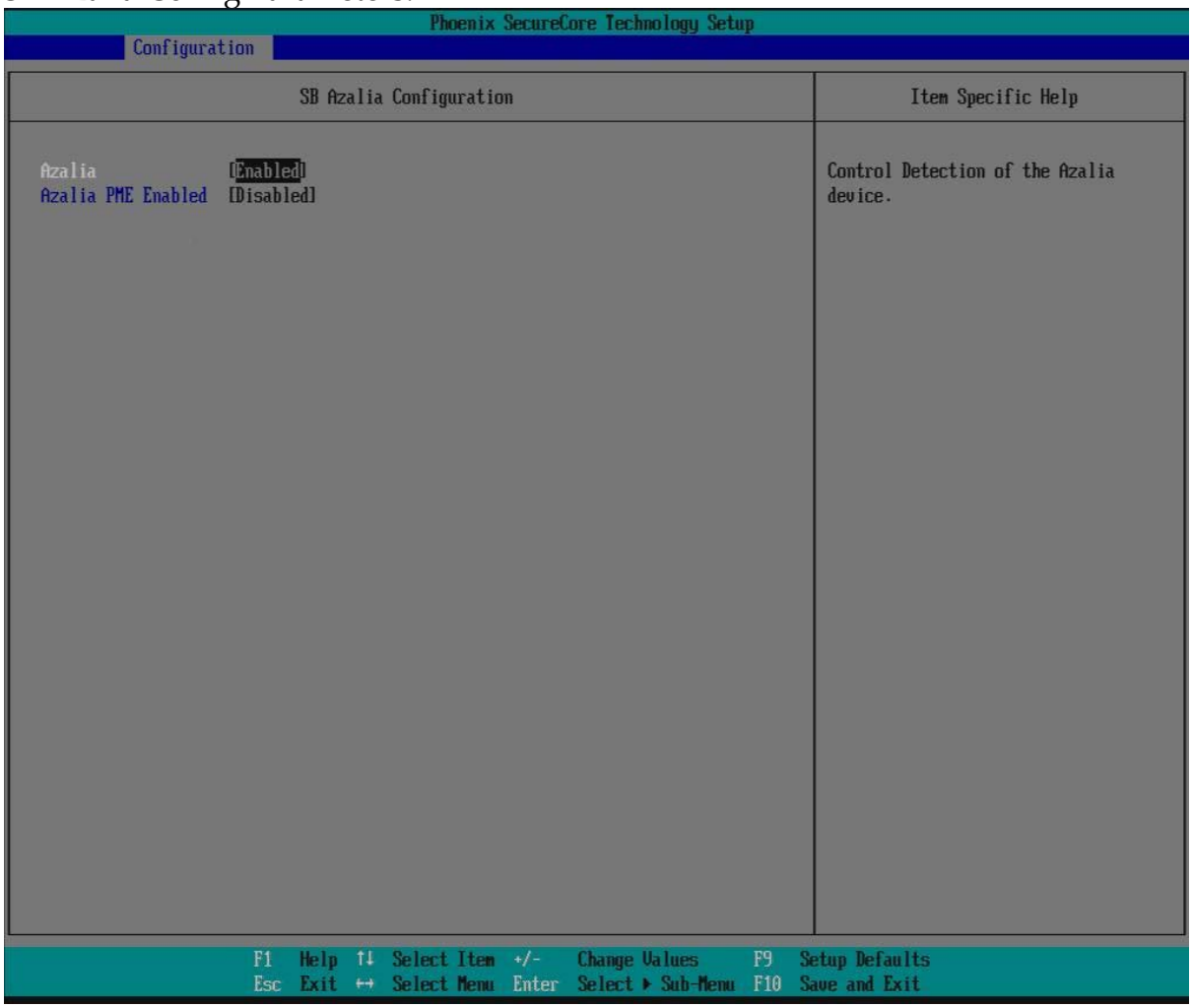
Maximum Memory Frequency Selections in Mhz.
Choices: Auto, 1067, 1333, 1600, 1867, 2133.

Memory ECC Support

Enabled/Disabled Memory ECC support function.
Choices: Enabled, Disabled.

SB Azalia Config

SB Azalia Config Parameters.


Phoenix SecureCore Technology Setup
Configuration
SB Azalia Configuration
Item Specific Help
Azalia [Enabled]
Azalia PME Enabled [Disabled]
Control Detection of the Azalia device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Azalia

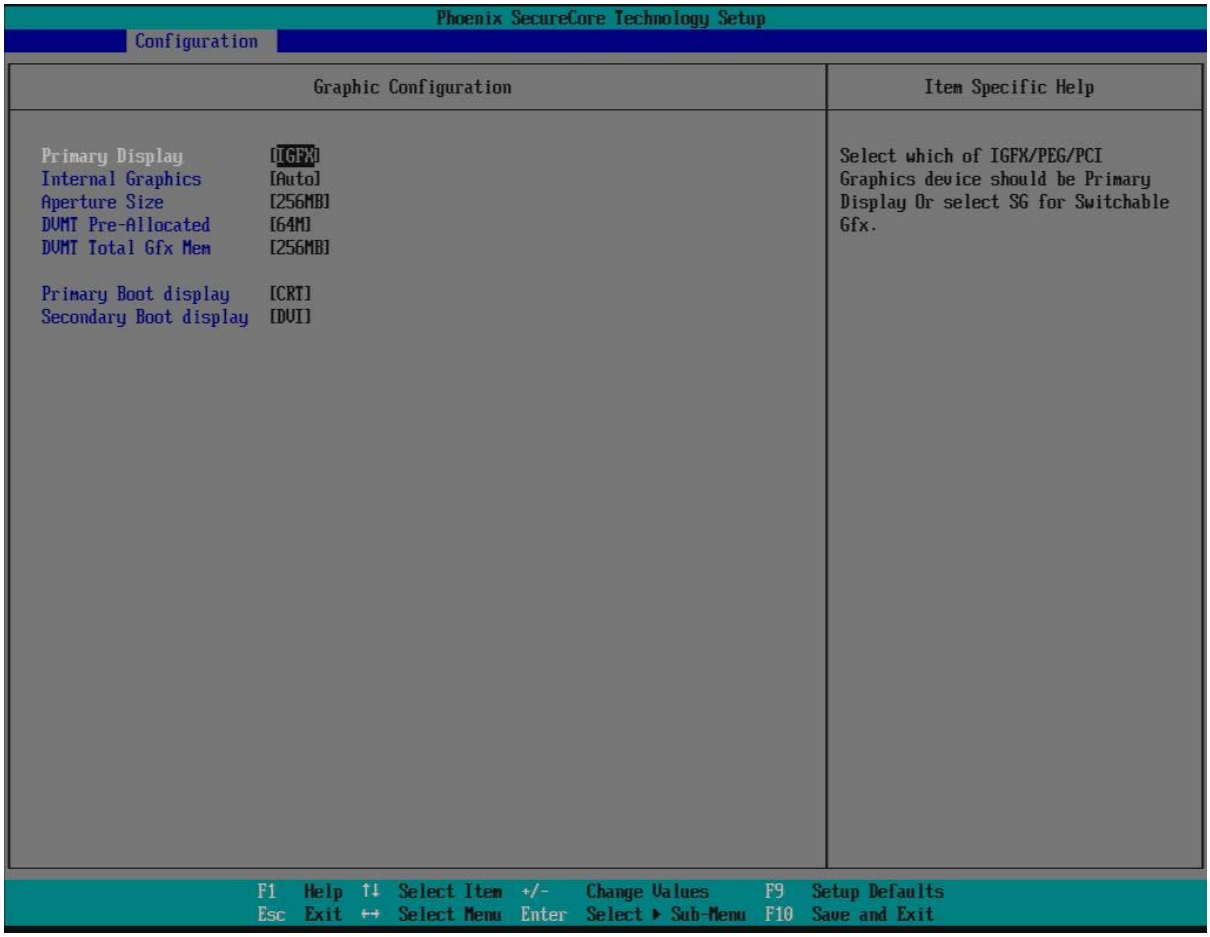
Control Detection of the Azalia device.
Choices: Disabled, Enabled.

Azalia PME Enabled

Enabled/Disabled PME for Azalia..
Choices: Disabled, Enabled.

Graphic Configuration

Configure integrated Graphic like Boot display, video memory and external Graphic feature.


Phoenix SecureCore Technology Setup
Configuration
Graphic Configuration
Item Specific Help
Primary Display [IGFX]
Internal Graphics [Auto]
Aperture Size [256MB]
DVMT Pre-Allocated [64M]
DVMT Total Gfx Mem [256MB]
Primary Boot display [CRT]
Secondary Boot display [DVI]
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Choices: Auto, IGFX, PEG, PCI.

Internal Graphics

Keep IGD Enabled Based on the setup options,
Choices: Auto, Disabled, Enabled.

Aperture Size

Select the Aperture Size
Choices: 128MB, 256MB, 512MB.

DVMT Pre-Allocated

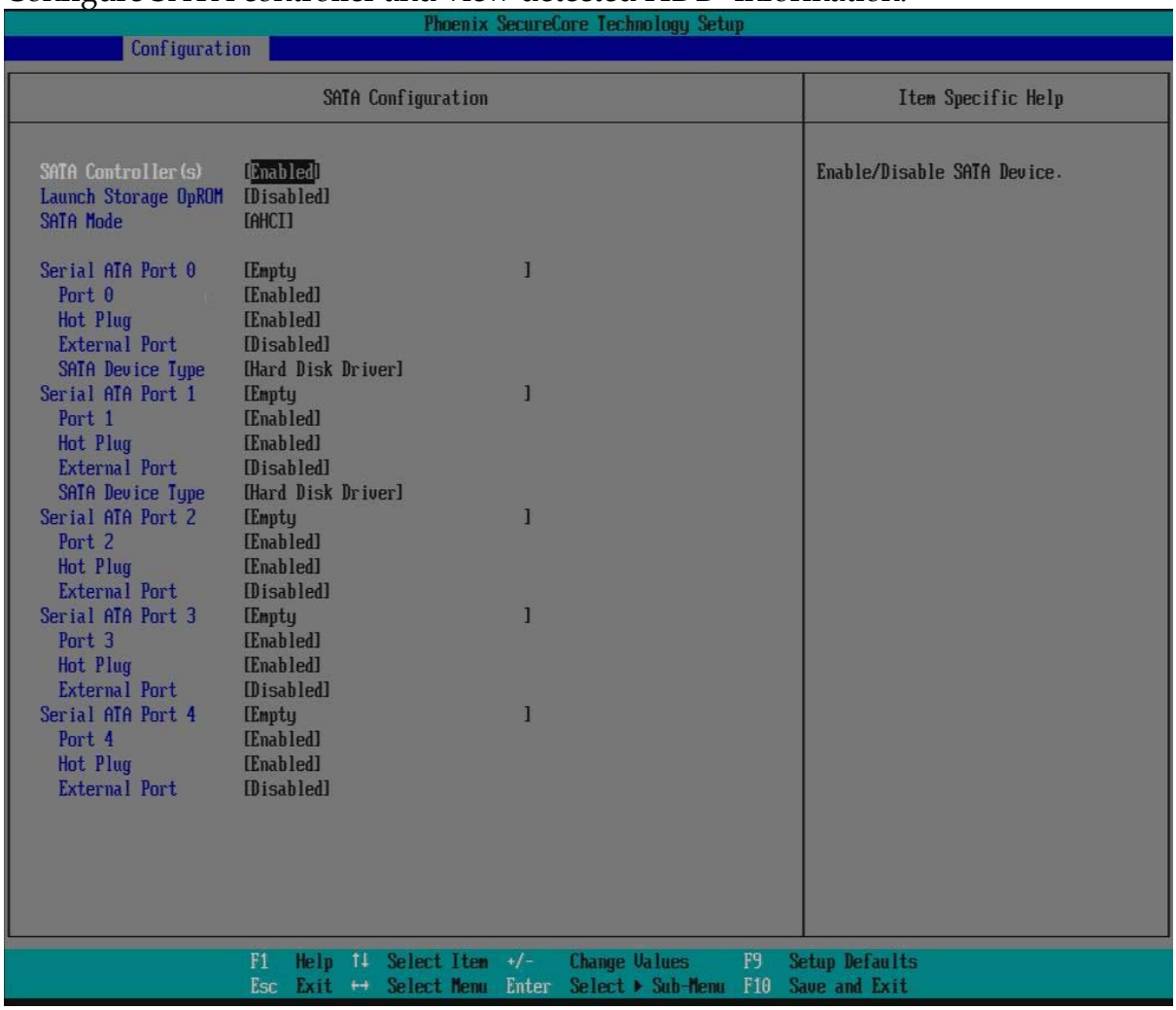
Select DVMT 5.0 Pre-Allocated Graphics Memory size used by the Internal Graphics Device.
Choices: 0M, 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M , 352M, 384M, 416M, 448M, 480M, 512M.

DVMT Total Gfx Mem
Select DVMT 5.0 Total Graphics Memory size used by the Internal Graphics Device.
Choices: 128MB, 256MB, MAX.

Primary Boot display
Choices: VBIOS Default, CRT, DVI, HDMI.

Secondary Boot display
Choices: VBIOS Default, CRT, DVI, HDMI.

SATA Configuration
Configure SATA controller and view detected HDD Information.


Phoenix SecureCore Technology Setup
Configuration
SATA Configuration
Item Specific Help
SATA Controller(s) [Enabled]
Launch Storage OpROM [Disabled]
SATA Mode [AHCI]
Serial ATA Port 0 [Empty]
Port 0 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Serial ATA Port 1 [Empty]
Port 1 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Serial ATA Port 2 [Empty]
Port 2 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 3 [Empty]
Port 3 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 4 [Empty]
Port 4 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Enable/Disable SATA Device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

SATA Controller (s)
Determines how SATA controllers (s) operate.
Choices: Disabled, Enabled.

Launch Storage OpROM
Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.
Choices: Enabled, Disabled.

SATA Mode
Determines how SATA controllers (s) operate.
Choices: Disabled, IDE, AHCI, RAID.

Serial ATA Port 0-4
Display the identity of the device attached.
Choices: Empty.

Port 0-4
Enabled or Disabled SATA Port.
Choices: Disabled, Enabled.

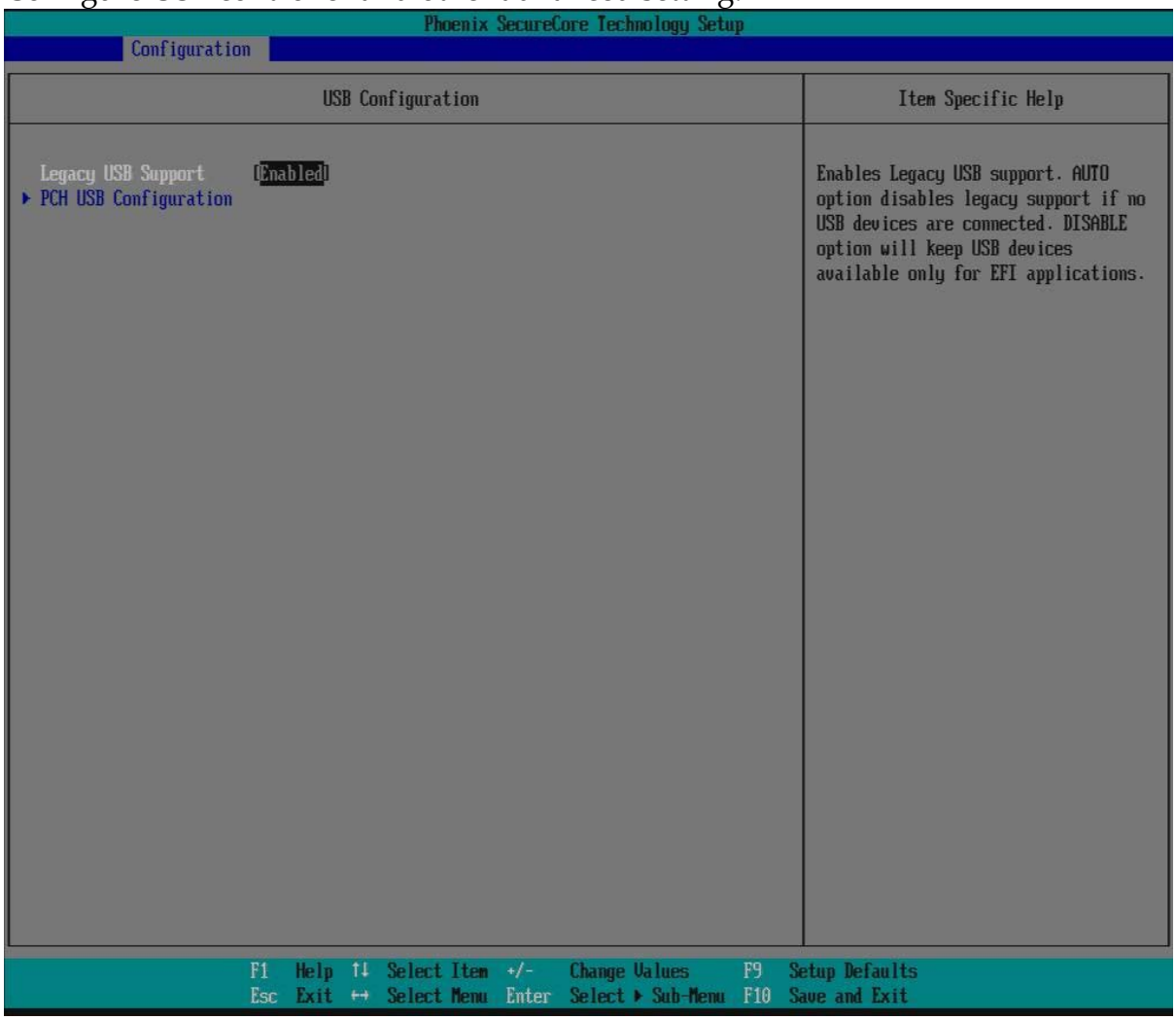
Hot Plug
Designates this port as Hot Pluggable.
Choices: Disabled, Enabled.

External Port
External SATA Support.
Choices: Disabled, Enabled.

SATA Device Type
Select "Solid State Drive" only if a Solid State Drive is connected to this SATA port.
Choices: Hard Disk Driver, Solid State Driver.

USB Configuration

Configure USB controller and other advanced setting.


Phoenix SecureCore Technology Setup
Configuration
USB Configuration
Item Specific Help
Legacy USB Support [Enabled]
PCH USB Configuration
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

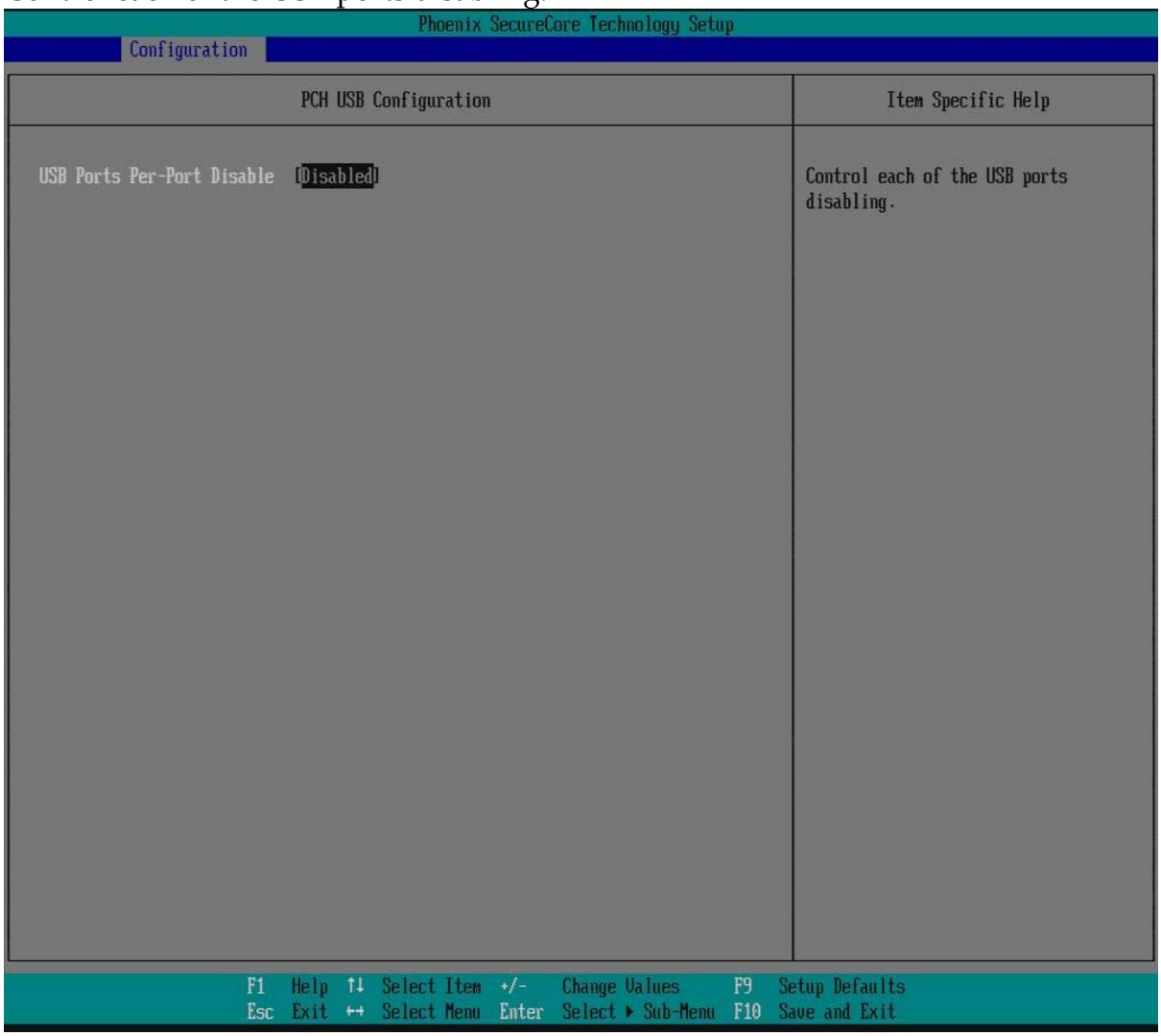
Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Choices: Enabled, Disabled.

PCH USB Configuration

Control each of the USB ports disabling.

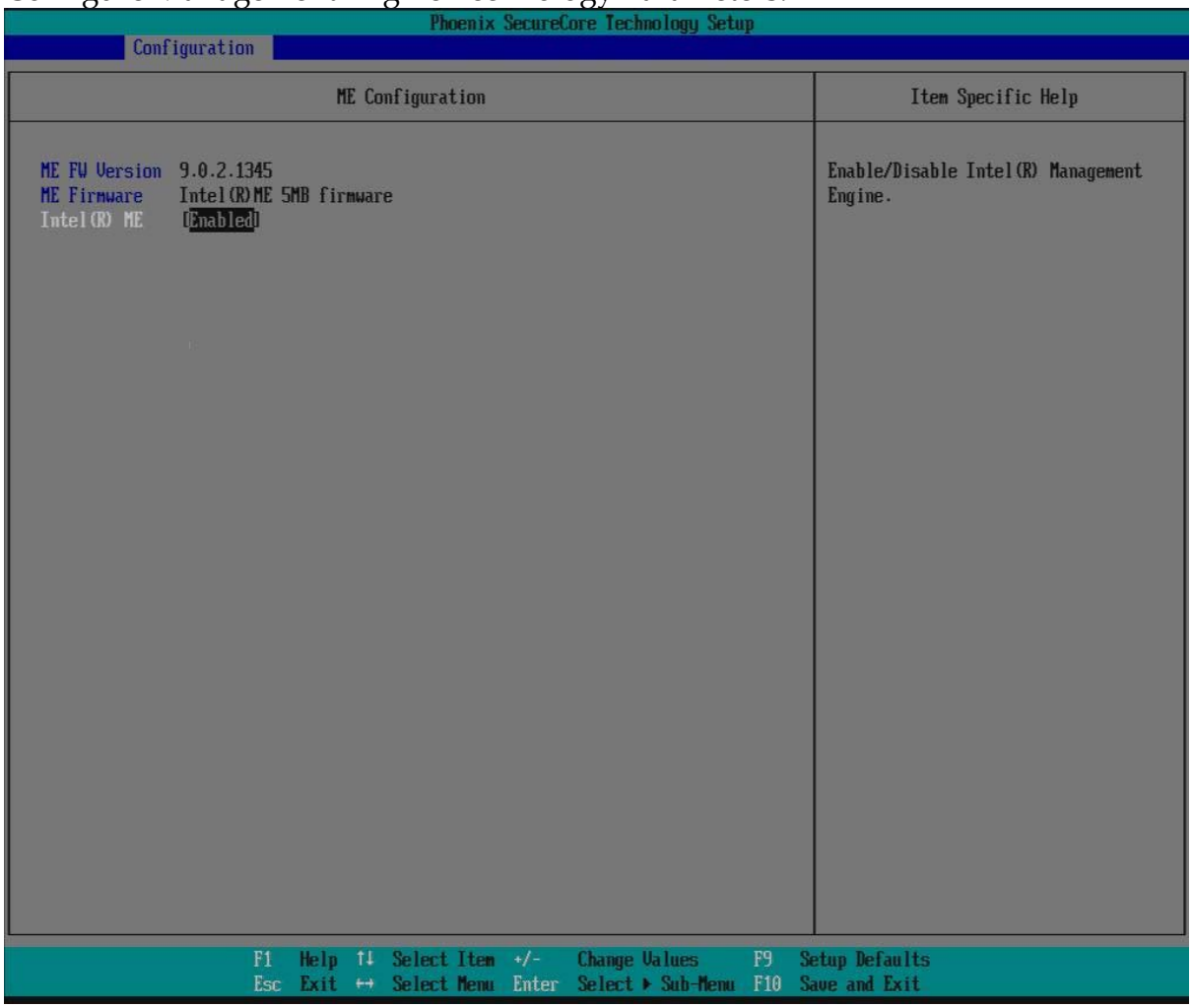

Phoenix SecureCore Technology Setup
Configuration
PCH USB Configuration
Item Specific Help
USB Ports Per-Port Disable [Disabled]
Control each of the USB ports disabling.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

USB Ports Per-Port Disable

Choices: Enabled, Disabled.

ME Configuration

Configure Management Engine Technology Parameters.

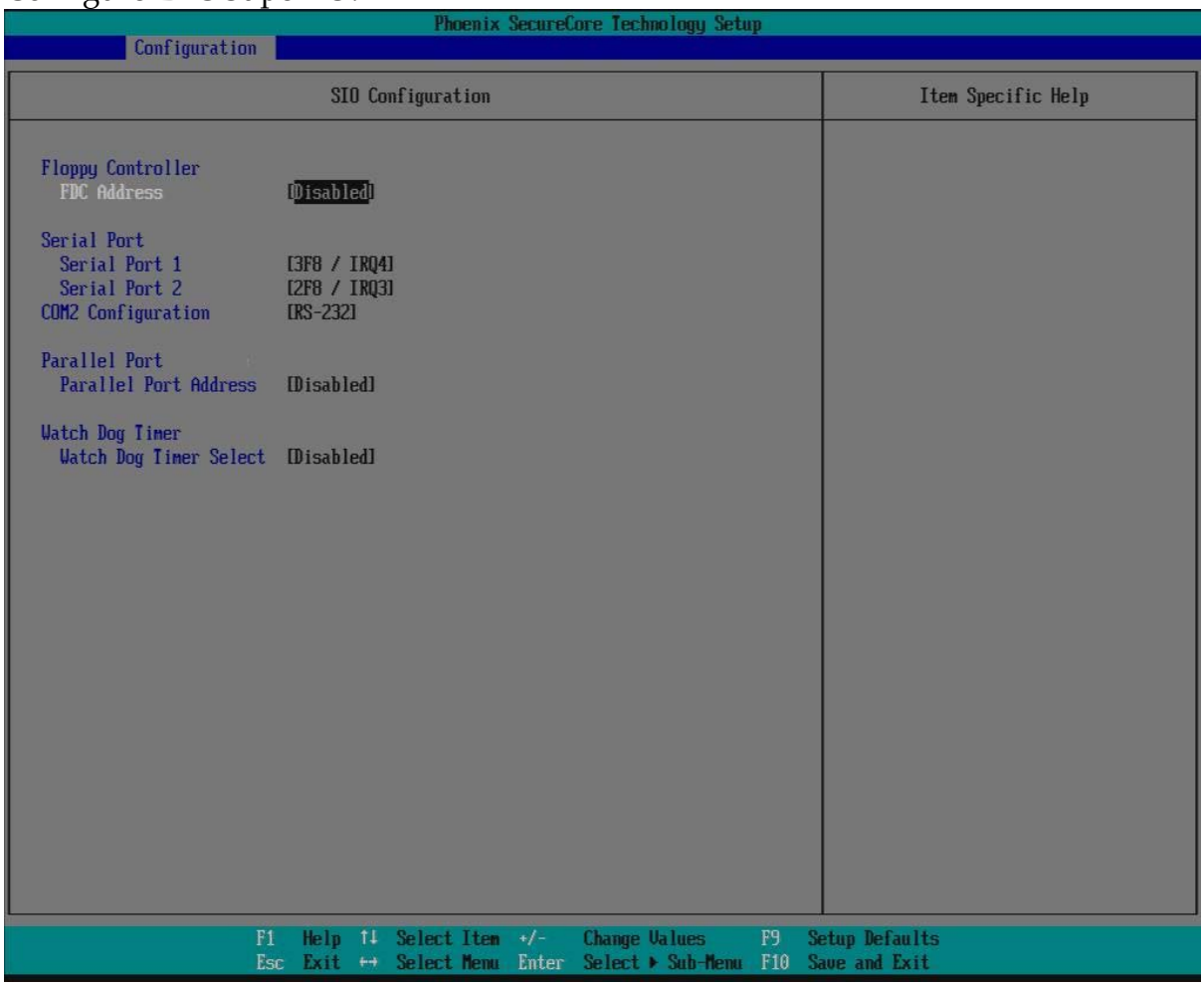

Phoenix SecureCore Technology Setup
Configuration
ME Configuration
Item Specific Help
ME FW Version 9.0.2.1345
ME Firmware Intel(R)ME 5MB firmware
Intel(R) ME [Enabled]
Enable/Disable Intel(R) Management Engine.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Intel (R) ME

Enable/Disable Intel (R) Management Engine.
Choices: Enabled, Disabled.

Super IO Configuration

Configure LPC Super IO.


Phoenix SecureCore Technology Setup
Configuration
SIO Configuration
Item Specific Help
Floppy Controller
FDC Address [Disabled]
Serial Port
Serial Port 1 [3F8 / IRQ4]
Serial Port 2 [2F8 / IRQ3]
COM2 Configuration [RS-232]
Parallel Port
Parallel Port Address [Disabled]
Watch Dog Timer
Watch Dog Timer Select [Disabled]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

FDC Address

Choices: Disabled, 3F0/IRQ6.

Serial Port 1-2

Choices: Disabled, 2F8/IRQ3, 3F8/IRQ4.

COM2 Configuration

Select Com2 Configuration.
Choices: RS-232, RS422, RS485.

Parallel Address

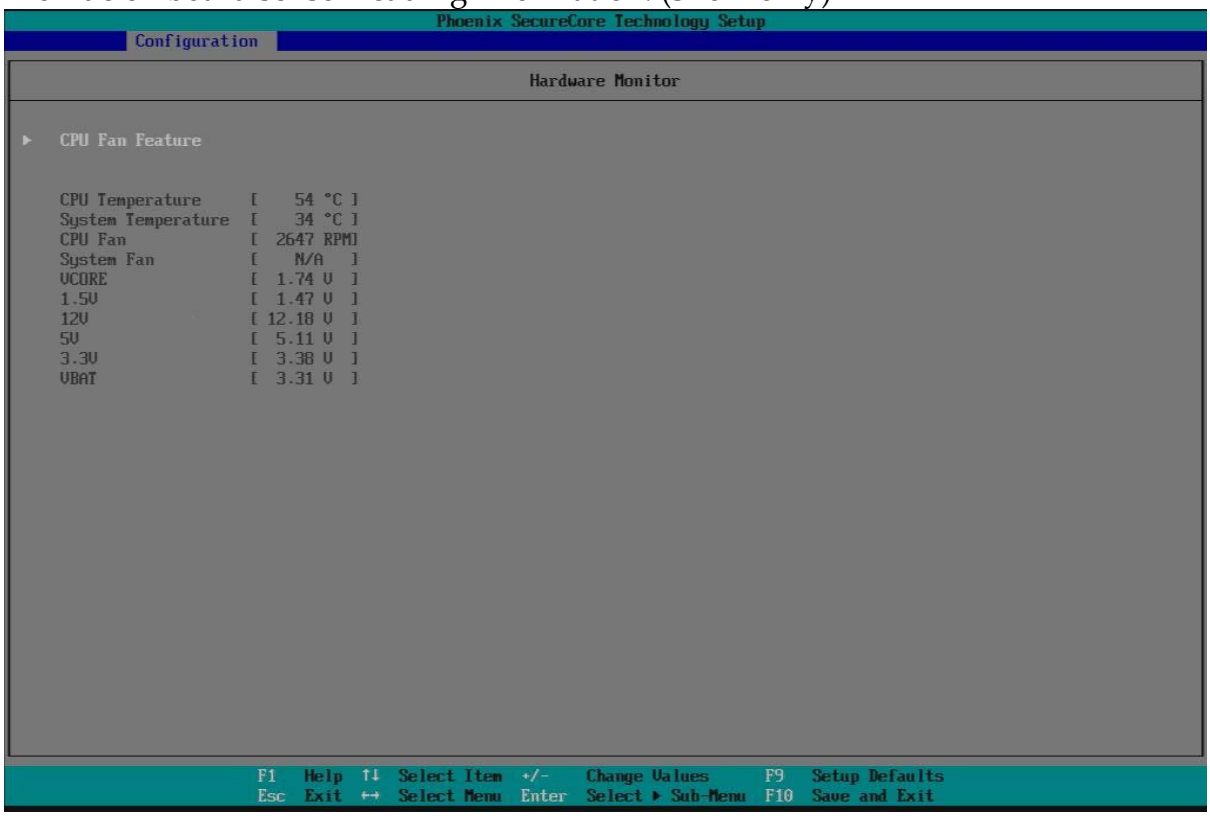
Choices: Disabled, 378/IRQ7.

Watch Dog Timer Select

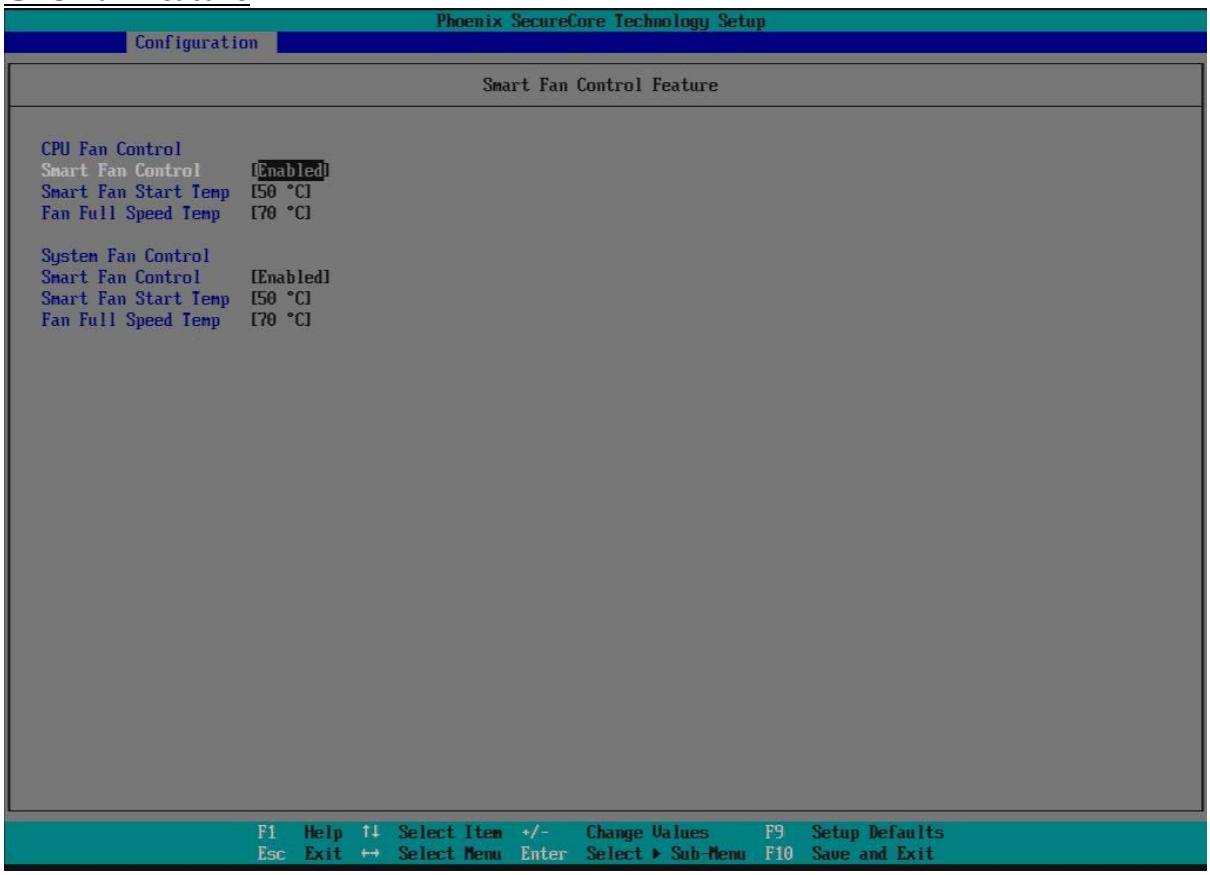
Choices: Disabled, 15 secs, 30 secs, 1 min, 2 mins, 3 mins.

Hardware Monitor

Provide on board sensor reading information. (Show only)


Phoenix SecureCore Technology Setup
Configuration
Hardware Monitor
CPU Fan Feature
CPU Temperature [54 °C]
System Temperature [34 °C]
CPU Fan [2647 RPM]
System Fan [N/A]
VCORE [1.74 V]
1.5V [1.47 V]
12V [12.18 V]
5V [5.11 V]
3.3V [3.38 V]
VBAT [3.31 V]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

CPU Fan Feature

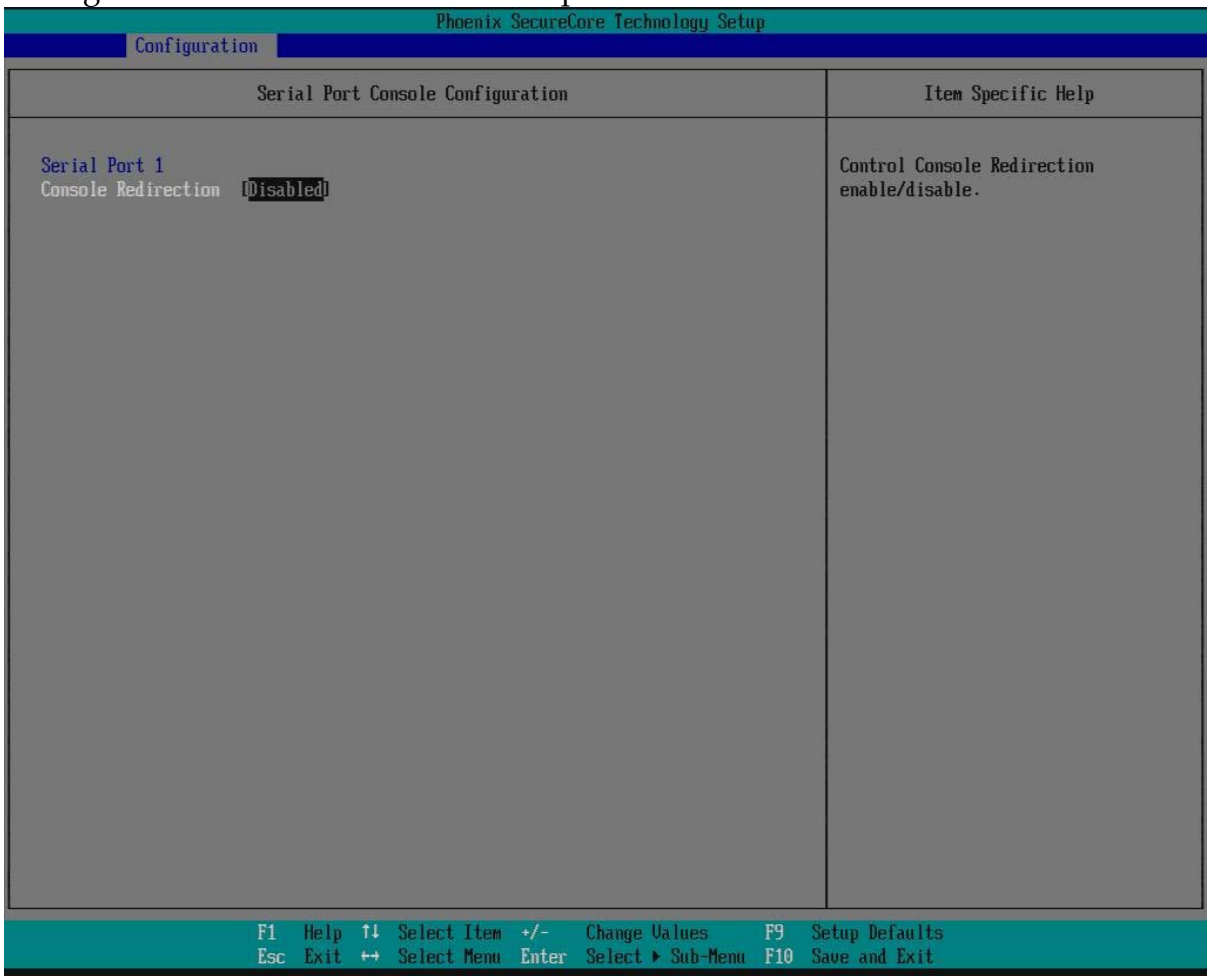

Phoenix SecureCore Technology Setup
Configuration
Smart Fan Control Feature
CPU Fan Control
Smart Fan Control [Enabled]
Smart Fan Start Temp [50 °C]
Fan Full Speed Temp [70 °C]
System Fan Control
Smart Fan Control [Enabled]
Smart Fan Start Temp [50 °C]
Fan Full Speed Temp [70 °C]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

CPU/System Fan Control
Smart Fan Control
Choices: Enabled, Disabled.

Smart Fan Start Temp
Choices: 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85 ℃.

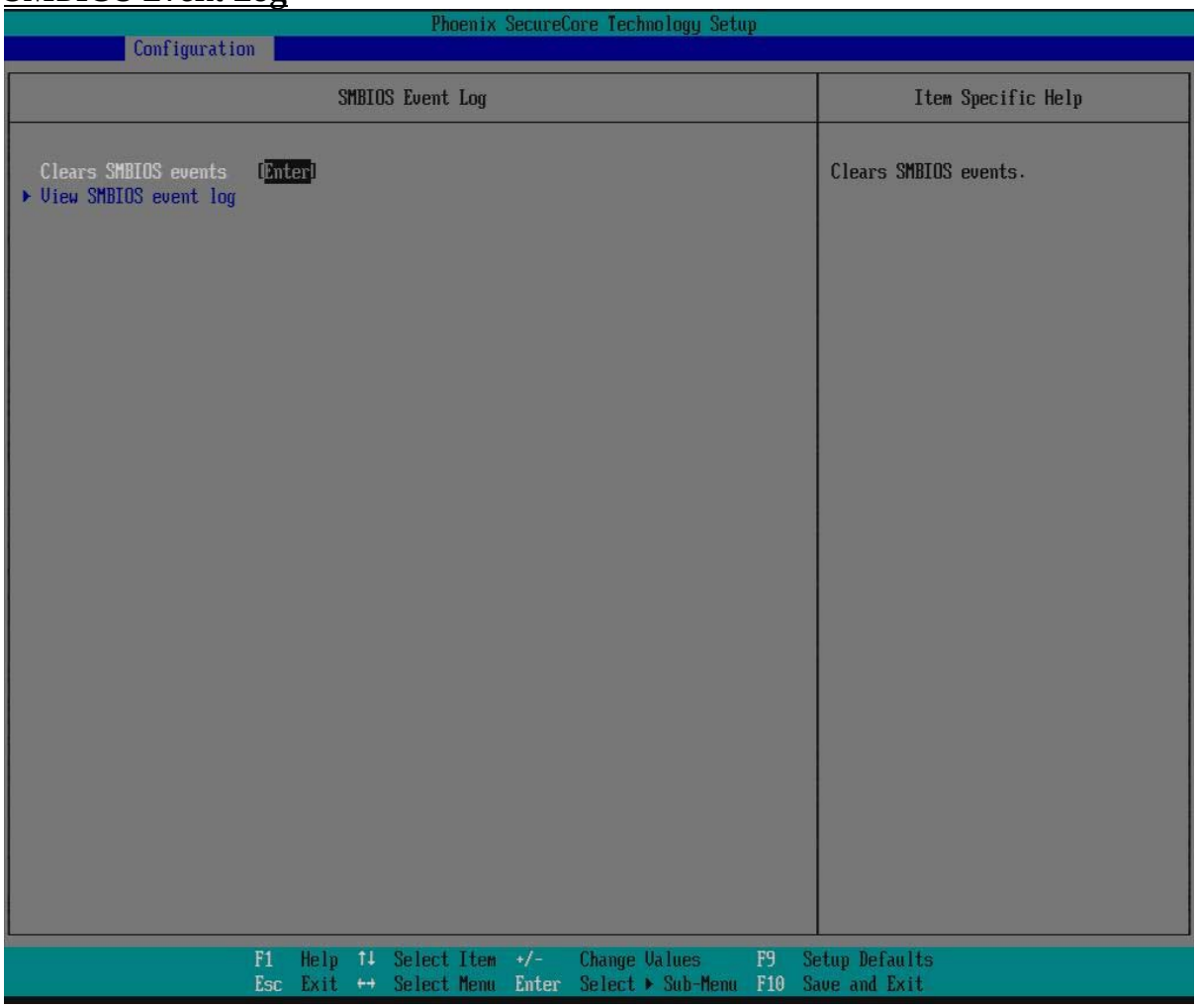
Fan Full Speed Temp
Choices: 50, 55, 60, 65, 70, 75, 80, 85 ℃.

Serial Port Console Configuration
Configure console redirection on serial port.


Phoenix SecureCore Technology Setup
Configuration
Serial Port Console Configuration
Item Specific Help
Serial Port 1
Console Redirection [Disabled]
Control Console Redirection enable/disable.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Console Redirection
Control Console Redirection enable/disable.
Choices: Enabled, Disabled

SMBIOS Event Log

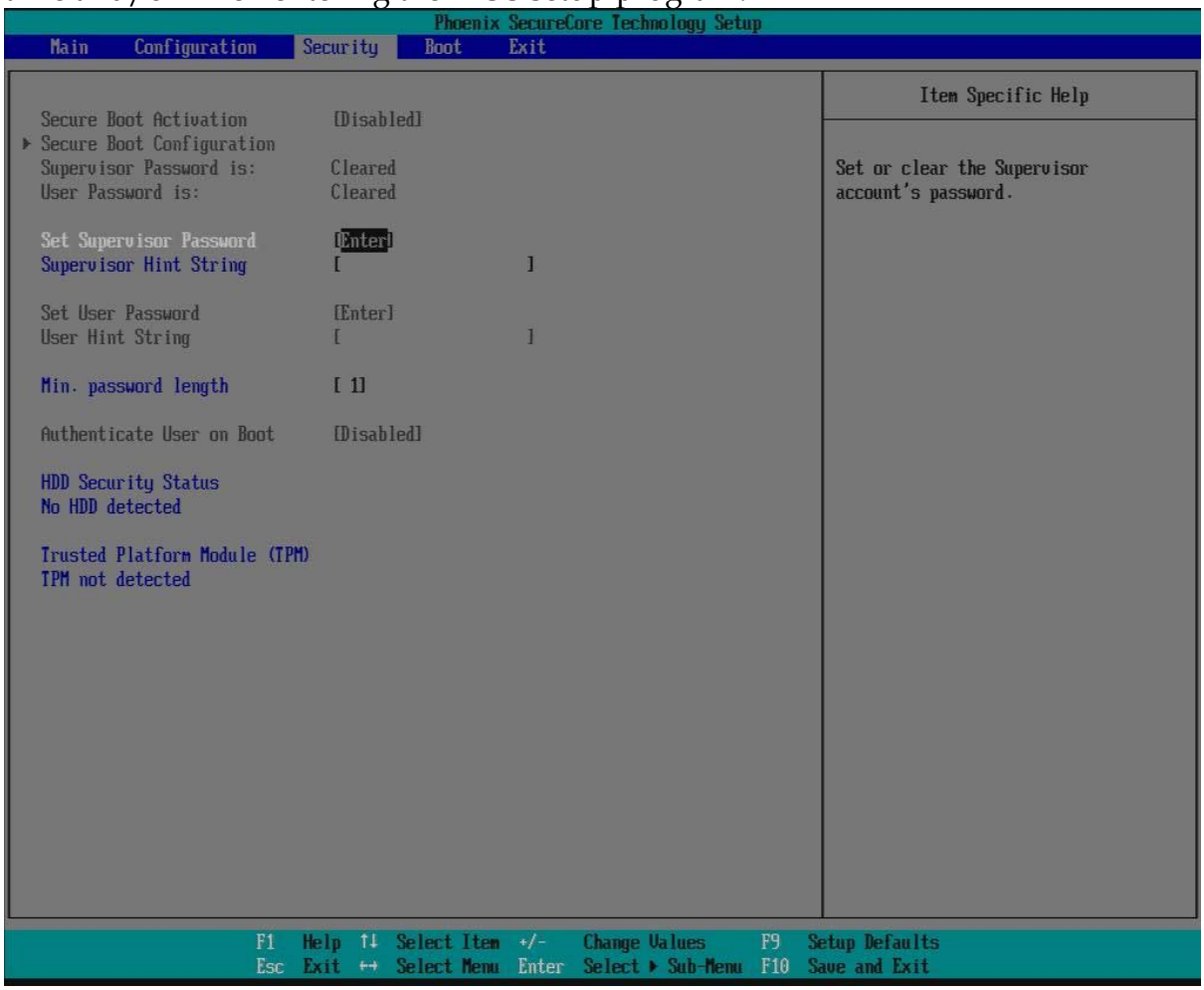

Phoenix SecureCore Technology Setup
Configuration
SMBIOS Event Log
Item Specific Help
Clears SMBIOS events [Enter]
View SMBIOS event log
Clears SMBIOS events.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Clears SMBIOS events.

Choices: Enter

4.4 Security

This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program.



Set Supervisor Password
Set or clear the Supervisor account's password.

Supervisor Hint String
Press Enter to type Supervisor Hint String.

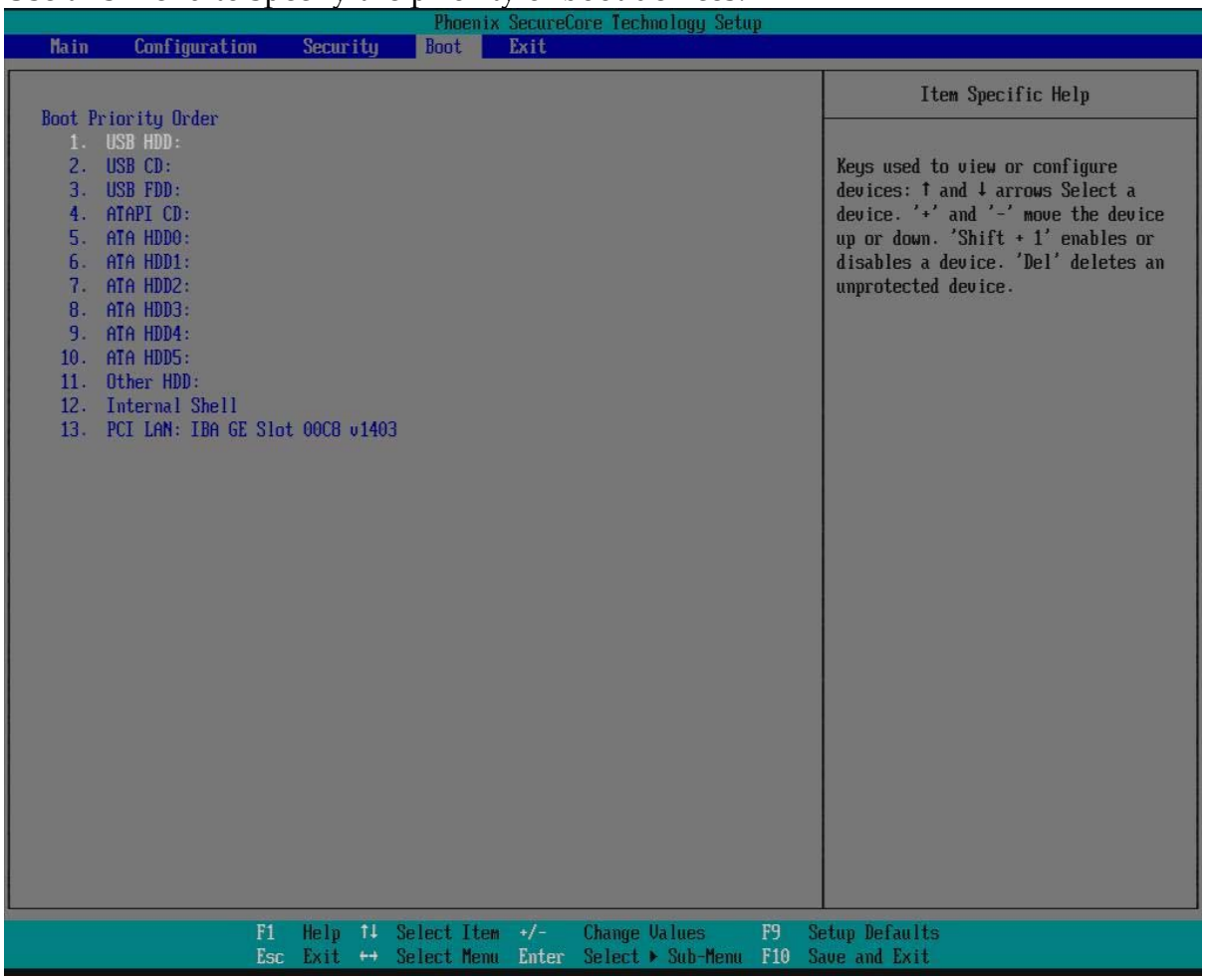
Set User Password
Set or clear the User account' password.

Supervisor Hint String
Press Enter to type User Hint String.

Min. password length
Set the minimum number of characters for password (1-20).

4.5 Boot

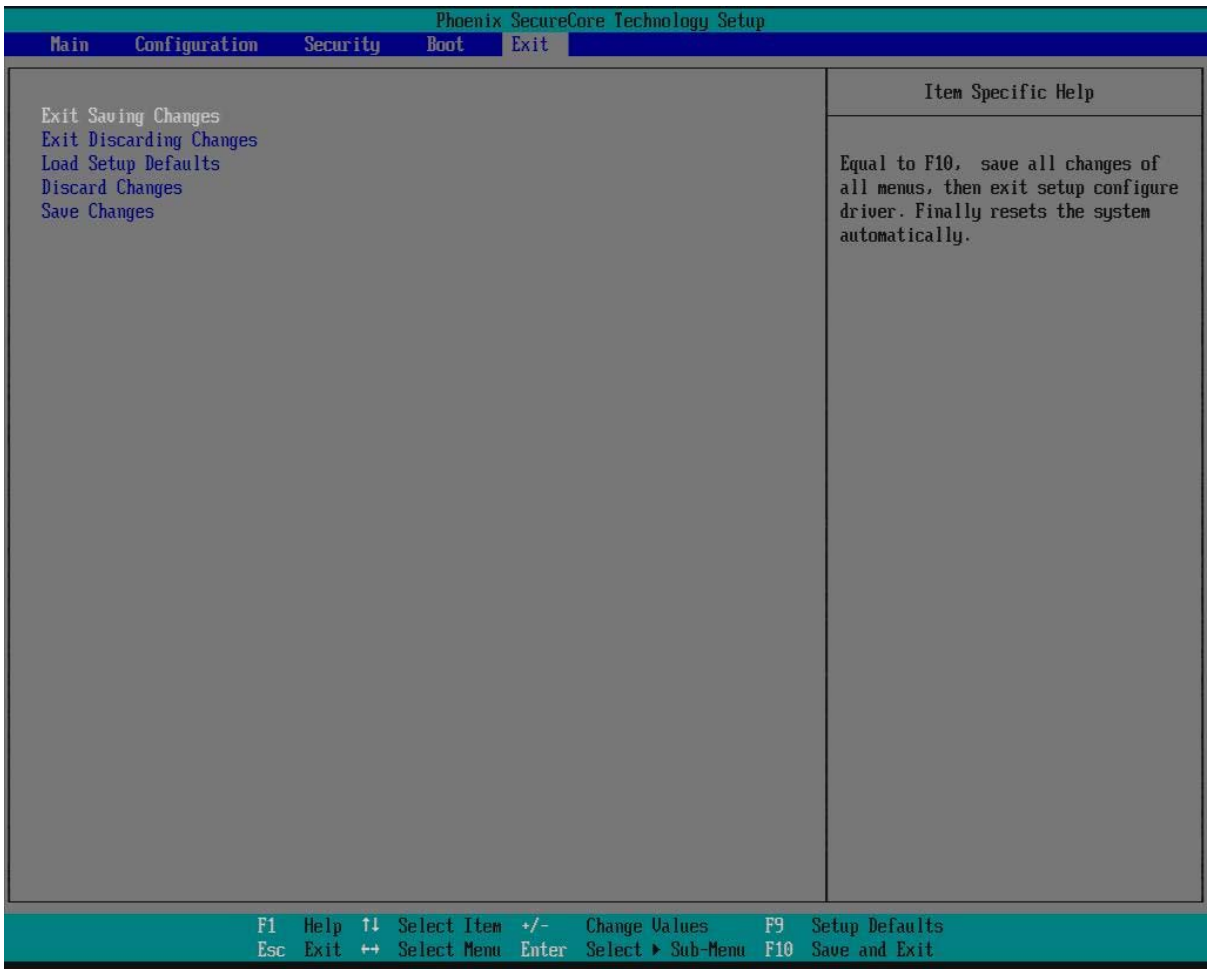
Use this menu to specify the priority of boot devices.


Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
Boot Priority Order
1. USB HDD:
2. USB CD:
3. USB FDD:
4. ATAPI CD:
5. ATA HDD0:
6. ATA HDD1:
7. ATA HDD2:
8. ATA HDD3:
9. ATA HDD4:
10. ATA HDD5:
11. Other HDD:
12. Internal Shell
13. PCI LAN: IBA GE Slot 00C8 v1403
Item Specific Help
Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-' move the device up or down. 'Shift + 1' enables or disables a device. 'Del' deletes an unprotected device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Boot Priority Order

Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-'move the device up or down. 'Shift + 1' enabled or disables a device. 'Del' deletes an unprotected device.

4.6 Exit


Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Exit Saving Changes
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.

Exit Discarding Changes
Equal to ESC, never save changes, then exit setup configure driver.

Load Setup Defaults
Equal to F9. Load standard default values.

Load Optimized Defaults
Load settings for optimized boot time and system performance.

Discard Changes
Load the original value of this boot time. Not the default Setup value.

Save Changes
Save all changes of all menus, but do not reset sys

Chapter 5
Troubleshooting

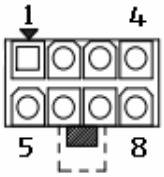
This chapter provides a few useful tips to quickly get ROBO-8112VG2AR running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, ROBO-8112VG2AR supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J19 (4 pins CPU+12V main power connector) & 24 pins ATX Power Connector.

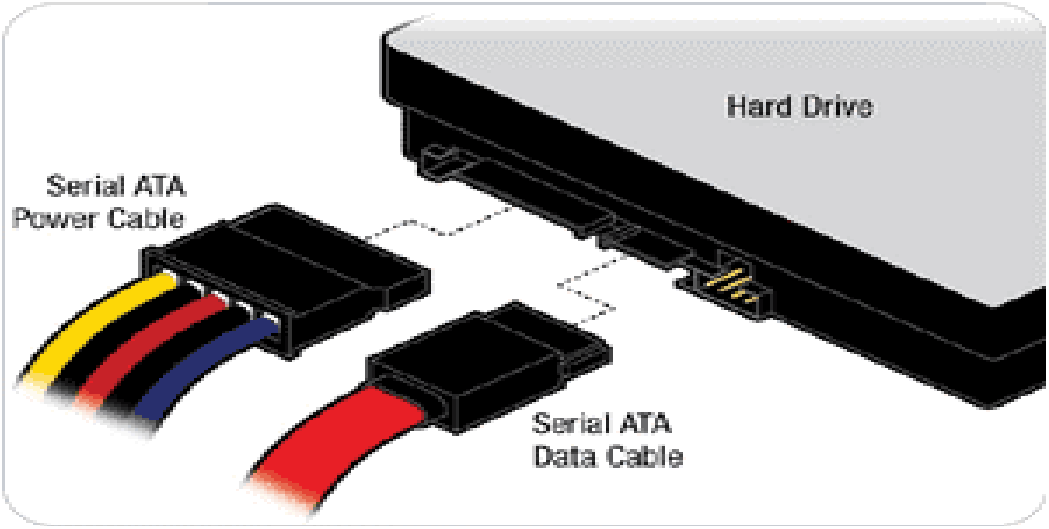
J19 :+12V POWER Connector



PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Ground
3	Ground	4	Ground
5	+12V	6	+12V
7	+12V	8	+12V

Serial ATA Hard Disk Setting for IDE/RAID/AHCI

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total six connectors, SATA1~6 port. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to operate IDE, RAID (0/1/5/10) and AHCI application for system, please follow up setting guide in BIOS setup utility



5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 204-pin DDR3 memory, keyboard, mouse, floppy drive, SATA hard disk, DVI-I connector, but it only can use on DVI-D function, doesn't support DVI-I function, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with ROBO-8112VG2AR, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "Load Optimal Defaults", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/

COM2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are
Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

Interrupt Request Lines IRQ		
IRQ#	**Current Use**	Default Use
IRQ 0	**Unused**	System Timer
IRQ 1	**System ROM**	Keyboard Event
IRQ 2	**【Unassigned】**	Usable IRQ
IRQ 3	**System ROM**	COM2
IRQ 4	**System ROM**	COM1
IRQ 5	**【Unassigned】**	Usable IRQ
IRQ 6	**System ROM**	Diskette Event
IRQ 7	**Unused**	Usable IRQ
IRQ 8	**System ROM**	Real-Time Clock
IRQ 9	**【Unassigned】**	Usable IRQ
IRQ 10	**【Unassigned】**	Usable IRQ
IRQ 11	**【Unassigned】**	Usable IRQ
IRQ 12	**System ROM**	IBM Mouse Event
IRQ 13	**System ROM**	Coprocessor Error
IRQ 14	**System ROM**	Hard Disk Event
IRQ 15	**【Unassigned】**	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Installation Problem

Question: How to update the BIOS file of the ROBO-8112VG2AR?

Answer:
Please visit web site of the Portwell download center as below hyperlink and registeran account. http://www.portwell.com.tw/support/ Input your User name and password to log in the download center. Select the "Search download" to input the keyword "ROBO-8112VG2AR". Find the "BIOS" page to download the ROM file and flash utility.

Execute the zip file to root of the bootable USB Pen drive.
Insert your bootable USB Pen drive in ROBO-8112VG2AR board and power-on.
Input the "FPT /f XXXXX.ROM /BIOS" to start to update BIOS. ("XXXXX" is the file name of the ROM file.)

Switch "Off" the Power Supply when you finished the update process.
To short the JP1 2-3 jumper for 5 seconds then set back to normal. (Clear CMOS)

Switch "ON" the Power Supply then press the "del" key to BIOS to load "Restore Defaults" then save them to exit.

Note:
Please visit our technical web site at http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or to our sales for further assistance. Thank you.

5.4 System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

System Memory Address Map		
Memory Area	*Size*	*Description*
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0548	19K	DOS
0549-0FC2	41K	Program Area
0FC3-9AFF	556K	【Available】
9B00-9CFF	8K	Unused
First Meg	-- Conventional memory end at 628K --	
9D00-9DFF	4K	Extended BIOS Area
9G00-9FFF	8K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CE9F	58K	Video ROM
CEA0-D09F	8K	ROM